Volume III

User's Manual

October 1973

SPB W. ter Impact Loads Computer Program

Space Shuttle
Solid Rocket
Booster Recovery
System Definition

N74-13580 Unclass 15877 STUTEM DEFINITION (Martin "LONGO VOLUME



DARTIN MARIETTA

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Volume III

User's Manual

October 1973

SRB Water Impact

Loads

Computer Program

SPACE SHUTTLE

SOLID ROCKET BOOSTER

RECOVERY SYSTEM

DEFINITION

Approved

Richard E. Brackeen. Program Manager

Shuttle Booster Programs

Richard & Brackery

MARTIN MARIETTA CORPORATION DENVER DIVISION P.O. Box 179 Denver, Colorado 80201

FOREWORD

This report is submitted in three volumes to the National Aeronautics and Space Administration, Marshall Space Flight Center, in partial fulfillment of the requirements of Contract NAS8-29622.

The objective of this contractual effort has been to define performance requirements, preliminary designs, and development program plans for an airborne recovery system for the Space Shuttle Solid Rocket Booster, with minimum total program costs being the primary selection criterion.

Volume I, entitled Technica? Report, Space Shuttle Solid Rocket Booster Recovery System Definition, contains the results of all analyses performed during the study term to define the performance requirements, preliminary designs, and development program plans for the SRB Recovery Subsystem.

Volumes II and III contain user's instructions for two computer programs developed in support of the contract technical studies. Volume II is entitled Solid Rocket Booster Water Impact Monte Carlo Computer Program and Volume III is entitled Solid Rocket Booster Water Impact Loads Computer Program.

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This user's manual describes the FORTRAN IV computer program developed to compute the total vertical load, normal concentrated pressure loads, and the center of pressure of typical SRB water impact slapdown pressure distributions specified in the baseline configuration, Preliminary Water Impact Loads for the Space Shuttle Solid Rocket Booster (SRB), dated 11 April, 1973.

The program prepares the concentrated pressure load information in punched card format suitable for input to the STAGS computer program. In addition, the program prepares for STAGS input the inertia reacting loads to the slapdown pressure distributions.

NOMENCLATURE

```
DEGREE TO HADIAN CUNVERSION
           180 LESS INCLUSIVE ANGLE/2 OVER WHICH REACTING STRAP BEARS
C ANGLE
C ANIL
           NORMAL INERTIA LUAD COMPONENT AT A NODE
C ANL
           NORMAL LOAD AT MESH PUINT
C ATIL
           TANGENTIAL INERTIA LOAD COMPONENT AT A NODE
C AVL
           VERTICAL COMPONENT OF NORMAL LOAD
C AWA
           WETTED ANGLE AT MESH POINT
C CP
           CENTER OF PRESSURE
C CPR
           RADIAL PRESSURE DISTRIBUTION CURVE 2 (WETTED ANGLE EQUAL 90)
C CWSR
           WETTED SURFACE MATIO OF YOURD IN MESH
CD
           VEHICLE DIAMETER
C DC
           INCHEMENTAL LENGTH IN SEGMENT Y
C DCPR
           INCHEMENTAL PRESSURE RATIO FOR CURVE 2
C DHPR
           INCREMENTAL PRESSURE RATIO FOR CURVE 1
C DL
           INCREMENTAL LENGTH IN SEGMENT X
C DPN
           INCREMENTAL PRESSURE
           INCREMENTAL VEHICLE STATION INCREMENTAL WETTEN ANGLE
C DVSD
C DWA
           INCREMENTAL WETTED SURFACE RATIO
C DWSR
C DX
           INCREMENTAL DISTANCE ALONG X COORDINATE
CUY
           INCHEMENTAL DISTANCE ALONG Y COORDINATE
C HC
           PORTION OF VEHICLE CIRCUMFERENCE
           RADIAL PRESSURE DISTRIBUTION CURVE 1 (WETTED ANGLE LESS 90)
C HPR
C HV
           HORIZONTAL VELOCITY
C KO
           CODE FOR DESIRED OUTPUT (0.1. OR 2)
C LA
           CODE FOR SHAPE OF PRESSURE CURVE (0 UR 1)
C LP
           CODE FOR SHAPE OF WETTED ANGLE CURVE (0 OR 1)
C NC
           NUMBER OF COLUMNS ALONG Y COORDINATE DIRECTION
C NCDP
           NUMBER OF CIRCUMFERENTIAL DATA POINTS FOR PRESSURE
C NLDP
           NUMBER OF LONG! UDINAL DATA POINTS FOR KEEL P. ISSURE
C NNX
           NUMBER OF SEGMENTS IN X DIRECTION WITH CONSTANT SPACING
C NNY
           NUMBER OF SEGMENTS IN Y DIRECTION WITH CONSTANT SPACING
C NR
           NUMBER OF ROWS ALONG X COORDINATE DIRECTION
           NUMBER OF MESH SPACES WITHIN SEGMENT X
C NSEGX
C NSEGY
           NUMBER OF MESH SPACES WITHIN SEGMENT Y
C PCR
           PRESSURE RATIO OF YCORD IN MESH AT A LONGITUDINAL STATION
C PI
           ΡI
           PRESSURE AT YCORD IN MESH
C PL
C PMAX
           MAXIMUM PRESSURE
C PN
           NORMALIZED PRESSURE AT A VEHICLE STATION
CR
           VEHICLE RADIUS
           UNIFORM STRAP BEARING LOAD AT A LONGITUDINAL STATION
C REACT
C RL
           AVERAGE PEAK HUNNING LOAD AT A LONGITUDINAL STATION
C SEGLX
           LENGTH OF SEGMENT IN X DIRECTION
           ANGLE OF SEGMENT IN Y DIRECTION
C SEGLY
C STRAP
           STRAP TENSION LUAD AT A LONGITUDINAL STATION
C STVIL
           TOTAL VERTICAL INERTIA LUAD ON VEHICLE
C STVL
           HALF OF TOTAL VERTICAL PRESSURE LOAD ON VEHICLE
           TOTAL FIRST MOMENT OF VERTICAL PRESSURE LOAD ON VEHICLE
C STVLXC
C SZTVL
           TOTAL VERTICAL LUAD ON VEHICLE DUE TO PRESSURE
           TIME POINT NUMBER
C THETA
           INCLUSIVE ANGLE USED IN VEHICLE MODEL (90 OR 180)
           TUTAL X LENGTH
C TNT
           TOTAL NUMBER OF TIME POINTS
           TOTAL VERTICAL INERTIA LOAD AT A VEHICLE STATION
C TVIL
           TOTAL VERTICAL PRESSURE LOAD AT A VEHICLE STATION
C TVLXC
           FIRST MOMENT OF TOTAL VERTICAL PRESSURE LOAD AT A STATION
```

NOMENCLATURE (CON-TD)

С	UB	UNBALANCE BETWEEN PRESSURE AND INERTIA LOADING
C	VIL	VERTICAL INERTIA LOAD AT A MESH POINT
C	٧L	VEHICLE LENGTH
C	VSD	NON-DIMENSIONAL VEHICLE STATION IN DIAMETERS
C	VV	VERTICAL VELOCITY
C	WA	WETTED ANGLE AT A VEHICLE STATION
C	WSR	WETTED SURFACE RATIO
C	XCORD	X-COURDINATE UF MESH POINT
¢	XPN	MAX PRESSURE AT A HUW IN MESH
C	XWA	AVERAGE WETTED ANGLE AT A ROW IN MESH
C	YCORD	Y-COORDINATE OF MESH POINT

1.0 PROGRAM DESCRIPTION

The program is designed to prepare point load cards that are representative of an arbitrary SRB water impact slapdown pressure distribution. The punched load cards are in a format compatible for use in the STAGS shell analysis program.

The program will compute in a single run the loads for an unlimited quantity of slapdown pressure distributions on any size vehicle.

The program utilizes as part of its input mesh definition cards identical to those required for STAGS input. The program then generates for an arbitrary mesh the normal point loads representative of the slapdown pressure distribution. In addition, the total vertical load and its center of pressure (relative to the initial vehicle station) on the vehicle are calculated.

The inertia reacting loads are calculated so as to balance the total vertical pressure load at each incremental vehicle station. The net normal and tangential load components are then computed for each mesh point in a format compatible for use in the STAGS computer program.

There are essentially 16 steps required to obtain a set of loads for each time point or slapdown pressure distribution. These are:

- reading data points required to describe the normalized pressure and wetted angle curves;
- 2) reading data to describe each time point and vehicle parameter;
- 3) dimensionalizing pressure versus vehicle station curve;
- 4) calculation or reading of X-coordinate data;
- ' calculation or reading of Y-coordinate data;
- 6) calculation of increments in vehicle length, pressure, and wetted angle data;
- 7) calculation of maximum pressure and wetted angle for each X-coordinate in mesh;

- 8) calculation of average peak running load for each X-coordinate in mesh;
- 9) calculation of average wetted angle for each X-coordinate in mesh;
- 10) calculation of incremental values for the two neudimensional radial pressure distribution curves;
- 11) calculation of wetted surface ratio, pressure ratio, and value of radial pressure loading at each mesh point;
- 12) calculation of equivalent normal pressure load and its vertical component at each mesh point and the total vertical pressure load for each incremental longitudinal station;
- 13) calculation of vertical inertia load and its normal and tangential component at each mesh point and the total vertical inertia load (equal and opposite to the total vertical pressure load) for each incremental longitudinal station;
- 14) calculation of net normal and tangential load components at each mesh point;
- 15) calculation of total vertical pressure load, its center of pressure, and any unbalance between the total vertical pressure and inertia load;
- 16) punched or written output of the net normal and tangential load components for each mesh point.

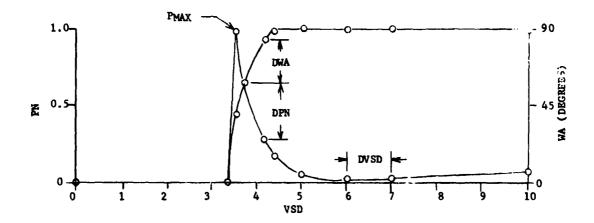
2.0 GENERAL NOTES

A portion of the program nomenclature is illustrated in Figures 2-1 and 2-2. The program assumes collapse pressures to be positive in value, and the vehicle model coordinate system to be as noted in Figure 2-2.

Since the program uses a linear integration scheme, the accuracy in the loads data will generally be a function of the mesh density. (Loads generally are more accurate for a denser mesh.) Also, to further improve the accuracy, the normalized data points used to describe the keel pressure and wetted angle curves should have the same vehicle station or X-coordinate as a mesh point. In addition, the LA-LP option code allows either a tapered or stepped shaped wetted angle and keel pressure distribution curve to be used. (See Example Problems 1 and 2.)

The program will use up to two normalized radial pressure distribution curves. Curve 1 should be used if the wetted angles are less than 90 deg, and Curve 2 should be used if the wetted angles are equal to 90 deg.

Depending upon the specified value of KO, the program will then calculate only the normal pressure loads, the net pressure and uniform inertia relief loads, or the normal pressure loads and the reacting strap normal bearing loads.



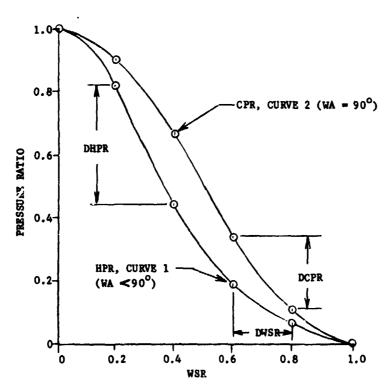
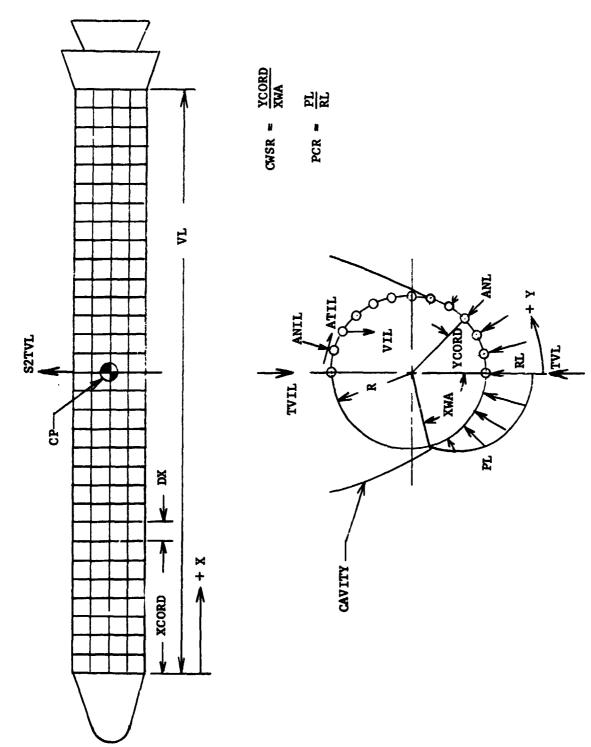


Figure 2-1 Program Nomenclature for the Normalized Pressure and Wetted Angle Curves



icle Parameters and Load Criculations Pigure 2-2 Program Nomenclature for the

3.0 DATA CARDS

As basic input data for each pressure distribution or time point, the following data cards are required.

For Each Run

Total number of time points or pressure distributions (REQUIRED);

For Each Time Point

- 1) Number of data points (20 max) required to properly define the normalized keel slapdown pressure distribution and wetted angle curves as a function of the normalized vehicle station, and the number of data points (20 max) required to define the two normalized radial slapdown pressure distribution curves (RFQUIRED);
- 2) Maximum keel pressure and wetted angle versus X-station curve data (REQUIRED);
- Radial pressure ratio versus wetted surface ratio curve data (REQUIRED);
- 4) Value of maximum slapdown pressure, number of time points, vertical and horizontal velocity, vehicle radius and length, and total angle used in STAGS model (REQUIRED);
- 5) Number of rows (100 max) and columns (37 max) in mesh (REQUIRED);
- 6) X-coordinate cards (OPTIONAL);
- 7) X-segment card (OPTIONAL);
- 8) X-segment lengths definition cards (OPTIONAL);
- 9) X-segment spacing definition cards (OPTIONAL);
- 10) Y-coordinate cards (OPTIONAL);
- 11) Y-segment card (OPTIONAL);
- 12) Y-segment lengths definition cards (OPTIONAL);
- 13) Y-segment spacing definition cards (OPTIONAL).

3.1 INSTRUCTIONS FOR CODING CARDS

For Each Run

1) Control card Format (F10.5)

For Each Time Point

 Control card for slapdown pressure and wetted angle curves and type of punched output desired.
 Format (515)

- LA = code for shape of wetted angle curve
 - 0 = tapered loading
 - · 1 = stepped loading
- LP = code for shape of pressure curve
 - 0 = tapered loading
 - 1 = stepped loading
- KO = code for punched loads output
 - 0 * normal pressure loads only
 - 1 = net pressure and uniform inertia relief loads
 - 2 = normal pressure and strap bearing loads
- 2) Keel pressure and wetted angle versus X-station curve data Format (6 F10.5)

^{*}CCN stands for card column number

3) Radial pressure ratio versus wetted surface ratio curve data Format (6 F10.5)

4) Pressure, time point, velocity, and vehicle data Format (8 Fl0.5)

5) Control card defining mesh size Format (215)

6) X-coordinate data Format (8E10.6)

7) Control card for X-segments Format (15)

8) X-segment length data Format (8E10.6)

9) X-segment spacing data Format (1615)

10) Y-coordinate data Format (8E10.6)

11) Control card for Y-segments Format (I5)

12) Y-segment length data Format (8E10.6)

13) Y-segment spacing data Format (1615)

4.0 SAMPLE PROBLEMS

The following sample problems are given to illustrate the input and output of the water impact loads program.

4.1 SAMPLE PROBLEM 1

The problem was designed to show the input and partial output for a keel slapdown pressure distribution typical of those shown in the baseline water impact loads document (4/11/73). The normalized pressure and wetted angle curves are shown in Figures 4-1 and 4-2.

4.2 SAMPLE PROBLEM 2

The problem was chosen to illustrate the input and partial output for a keel slapdown pressure distribution like that simulated on the 120-in. diameter test specimen. The normalized pressure and wetted angle curves are shown in Figures 4-3 and 4-4.

4.3 PROGRAM LISTING

A complete listing of the FORTRAN IV program is given to aid in illustrating the integration steps used to obtain a set of loads.

4.4 THREE SUPPLEMENTAL PROBLEMS

Three supplemental problems were also run to generate the punched load cards representative of a slapdown pressure distribution of the same general shape as that simulated on the 120-in. diameter test specimen. However, the peak pressures were reduced from those in Sample Problem 2 and the location of the distribution was varied. (See listing of input data cards on page 65. For a listing of the normal concentrated pressure loads for each supplemental problem, see page 66.) The punched cards are in a format suitable for use in the 90-deg STAGS model of the 120-in. diameter static test specimen. In addition, the total vertical pressure load and its center of pressure are punched as a card for each distribution.

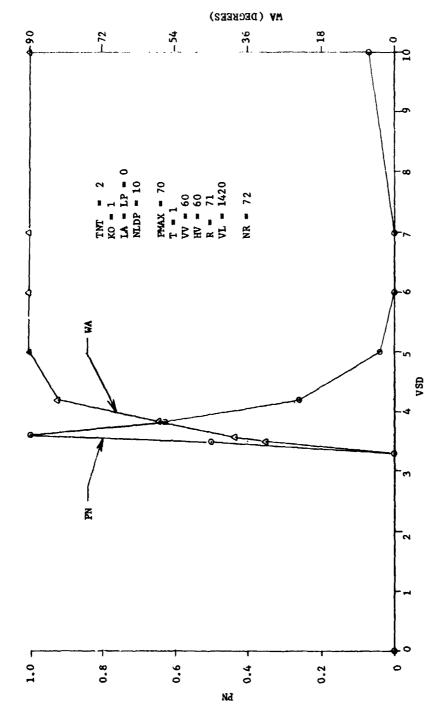


Figure 4-1 Normalised Keel Pressure and Wetted Angle Distribution for Example Problem 1

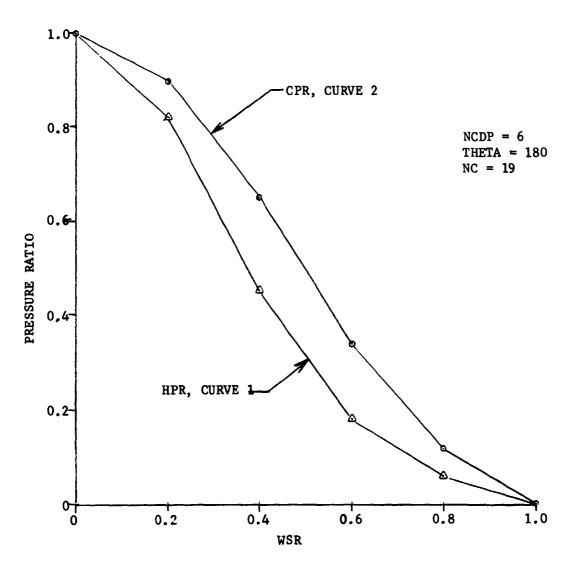


Figure 4-2 Normalized Radial Pressure Distribution for Example Problem 1

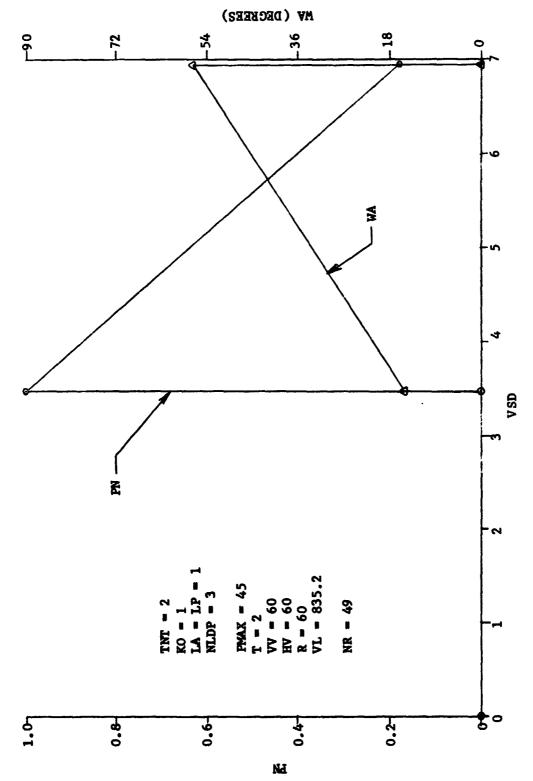


Figure 4-3 Normalized Keel Pressure and Wetted Angle Distribution for Example Problem 2

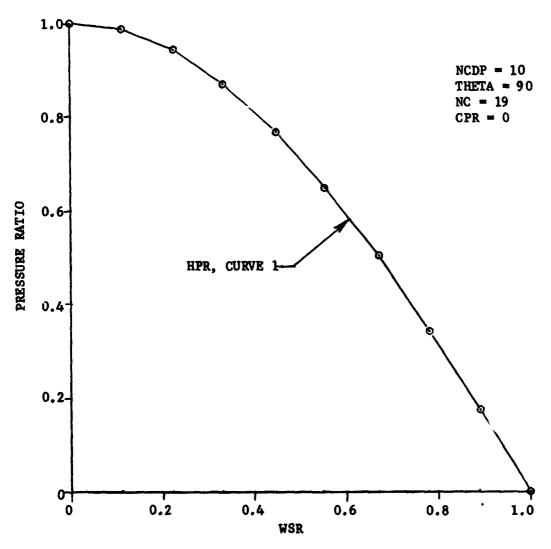


Figure 4-4 Normalized Radial Pressure Distribution for Example Problem 2

LISTING OF INPUT DATA CARDS FOR EXAMPLE PROBLEMS 1 AND 2

2.0								
10	€	0)	1				
0.0		0.0		0.0	3.30986	0.0	0.0	
3.52	113	30.0		0.5	3.59155	38.0	1.0	
3.80	282	58.3		0.63	4.19815	83.0	0.26	
5.0		90.0		0.04	6.0	90.0	0.0	
7.0		90.0		9.0	10.0	90.0	0.07	
0.0		1.0		1.0	0.2	0.82	0.9	
8.4		8.45		0.65	0.6	0.18	0.34	
0.5		0.06		0.12	1.0	0.0	0.0	
70.0		1.0		60.0	60.0	71.0	142040	180.0
72	19							
3	10	1	1	1				
0.0		0 - 0		0.0	3.47999	15.0	1.0	
6.96	001	60.0		8.17778				
0.0		1.0		a.c	6.11111	0.98431	0.0	
0.55	222	0.939	63	0.0	0.23333	0.86603	0.0	
0.44	444	0.766	0 '4	0.0	0.55555	0.64279	0.0	
3.66	666	0.5		8.C	0.77777	0.34202	0.0	
0.58	888	0.173	55	0.0	1.0	0.9	0.0	
45.0		2.0		ò0∙€	66.6	60.0	835.2	90.0
49	10							

LISTING UF NET NORMAL AND TANGENTIAL LOADS FOR EXAMPLE PROBLEM 1

XCGPD YCCPCY ANL ATTL 3. 0. 0. 0. 9. 10.0000 0. 0. 3. 20.0000 0. 0. 0. 30.0000 0. 0. 0. 40.0000 0. 0. 0. 40.0000 0. 0. 0. 50.0000 0. 0. 0. 60.0000 0. 0.	748.84
9. 10.0000 0. 3. 20.0000 0. 0. 0. 30.0000 0. 0. 0. 40.0000 0. 0. 0. 50.0000 0. 0. 0. 60.0000 0. 0.	
9. 10.4030 0. 0. 3. 20.0000 0. 0. 0. 30.0000 0. 0. 0. 40.0000 0. 0. 0. 50.0000 0. 0. 0. 60.0000 0. 0.	
3. 20.0000 0. n. 0. 30.0000 0. 0. 0. 40.0000 0. 0. 0. 50.0000 0. 0. 0. 60.0000 0. 0.	
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0. 150.00000 0. 0.	
9. 170.9Crcr 9. 0.	
J. 190.nrcpp c. 0.	
20.00000 0. 0.	
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20.07990 40.00900 0. 0.	
23.07979 50.00000 0.	
20.0000 60.0000 0. 0.	
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90.00000	110.00000	0 •	7 •
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90.00790	130.00000	0•	0.
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90.00000	150.0000	0 .	0.
90.03707	150.0000	0.	0.
90.01010	170.0000	0.	0.
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99.00000	133.30000	0.	0.
100.37030	0.	G.	0.
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170.07778	50.0000	0 •	0.
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100.00000	40.08000	G •	0.
173.07398	54.0000	0.	C.
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100.00700	90.CC00C	0 •	·
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100.00000	90.00000	¥ •	0.
192.00300	100.00000	C •	7.
100.90000	113.0000	C •	6.
130.0000	120.0000	0 •	0.
190.09999	130.40000	0.	0.
130.01090	144.00000	0•	0.
130.09999	154.00000	0.	0.
100.03000	150,00000	0 •	0.
130.00700	170.00000	0 •	0.
110.00000	180.0000	0.	0.
120,00000	9•	0.	0.
120.07000	10.00000	0 •	0.
120.90700	20.0000	0.	0.
120.00000	30.0000	0•	0.
128.00000	40.06260	0 •	0.
120.00000	50.0000	0•	0.
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123.07000	130.01960	c •	0.
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120.03030	150.30000	ŋ .	0.
121.00000	164.90004	0.	0 •
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140.01100	٠.	6 •	n •
149.09990	10.06769	r •	3.
140.02000	20.00000	0.	r.
148.00000	/3.30000	_	
		0.	0+
140,00000	40.00000	C.	0.
447.01000	50.0C76C	3.	0.
140.31300	5º.00360	0.	9.
		n .	
140.00300	70.0000		C •
143.00000	30.01310	G.	0.
140.00000	30.0000	9.	9•
140.03000	130.5000	C •	n.
140.0000	110.00000	0 •	G.
149.99330	120.3060	0.	1 •
143.07076	170.00000	C.	0.
103.3000?	140.10000	0 •	0.
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147.0000	152.00000	<u>^</u>	G.
140.0100	160.2190	Ç.	0.
140.03309	170.00000	0.	0.
141.13161	180.0000	ο.	0.
160.01300			
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160.01300	10.00000	ۥ	C •
160.09335	20.3000	0.	0.
163.0000	30.0560	0.	0.
100.00000	47.00760	ů.	g.
153.07378	50.6000	<u>r</u> •	0.
150.00000	Რ ୩•↑[@@@	• •	9.
160.00000	70.0C3C0	O •	0.
150.00000	39.06307	Ū •	9.
160.0000	99.0000	Ö.	0.
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150.0:000	100.0000	0.	0.
150.00730	113.76686	₽•	ο,
140.70300	120.00900	0.	n.
160.00300	130.0000	0.	0.
150.09990	147.00000	n.	0.
150.03300	150.00060	Ç•	ŋ.
160.00000	16% 00000	9 •	0.
160.01300	170.0000	9.	0.
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169.00700	140.46770	<u>"</u>	0.
130.03300	0 •	n •	0.
190.77700	19.00000	g.	C •
130.00000	30.0000	0 •	0.
146.00026	. 30.0000		0.
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190.23330	40.00067	0•	0.
130.03700	50.1100	9•	0.
199.33830	60.00000	0.	0.
110.00010	70.90006	č.	0.
190,00000	03033.38	<u>o</u> •	7.
190.00000	90.31910	C •	0.
199.00000	1 4 6 . 0 6 6 6 0	ρ.	n.
130.00*30	110.00000	ů.	7.
190.00330	120.0000	0.	0.
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190.00000	130.00002		0.
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193.00300	150.00300	C.	ņ.
190.07001	153.0000	n .	0.
190.07000	175.36900	0 •	9.
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294.C~C39	10.00000	0 •	€.
230.03000	20.0000	0.	0.
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230.33000	50.00000	9.	C.
230.30n3n	sc.grovc	C •	0.
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296.05119	100.0000	n.	9.
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239.01300	150.30007	C •	0.
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203.01005	130.0786	ί.	0.
229.03959	6.	Ĉ.	0.
221.01001	16.00035	G.	0.
220.00000	20.00000	0.	0.
224.00030	30.0660	č•	9.
220.03316	40.00046	0.	0.
223.00000	50.00065	9.	9.
224.03030	50.00000	8.	0.
220.03330	76.00060	0.	G.
72 0. 08030	Ar. OCOGr	0.	0.
220.01500	90.0000	9•	е.
220.02700	100.00900	0.	0.
220.00973	119.06660	0.	Q.
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720.01000	130. FCO CO	C •	8.
720.00000	140.70000	0.	0.
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240.03000	0.	0.	0.
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243,0330	20.0000	9•	0.
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239.90000	150.70000	0.	9.
290.22002	160.00000	ņ.	Ó.
248,61300	170.60000	9.	0.
297,00339	196.90000	0.	0.
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376.00376	50.30760	0.	0.
307.00000	60.36966	0.	0.
390.97008	70.0000	0.	r.
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370,00000	93.00360	0.	0,
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310.00001	120.00000	7.	C.
300.03100	130.60000	0.	0.
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374.03900	130.0000	7.	ĵ.
330.01100	160.00000	C.	9.
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430.03330	140.55165	•	0.
403.00100	150.0000	2.	0.
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470.03000	170.00000	•	0.
490.00393	180.00000	ç.	9.
420.0770r	ŷ•	g .	Ç.
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423.01039	20.01001	C •	0.
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420.38389	100.5000	3.	0.
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420.01988	120.0000	0.	8.
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420.00207	160.00060	0.	0.
423.07300	170.00060	0•	0.
420.01030	180.36000	0.	0.
440.03309	n.	0.	0.
440.93709	10.00000	0.	0.
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440.01760	103.00000	C •	0.
440.01200	110.00000	C.	0.
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444.07700	147.00000	0.	C.
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468.00380	ů.	-130.65661	9.
463.33030	10.0000	-35.27852	-1.73751
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450.03030	40.30000	7.55497	-6.45.67
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460.37379	70.05360	7.47272	-9.40248
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46 J. 9 7 8 3 3 4 9	130.00700	-6.43167 -7.66407	-7.66497
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450.71300	150.0000	-8.F6537	-5.33295
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490.03700	3.	-997.67960	0.
493.80000	10.00mm	-879.24797	-19.66507
490.03330	20.3000	97.61809	-76.76301
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490.03070	49.7688ô	82.34347	-69. 391 96
430.07379	50.00000	50.09186	-82.74747
4-0.61707	60.00000	53.74792	-93.18721
483.07330	70.0000	36.76301	-101.37554
450.30000	30.40000	14.66507	-105.35406
493.0000	99.G(06r	00008	-107.48785
490.00000	130.0000	-18.66567	-105.95486
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490.03000	120.90000	-53.74392	-93.18721
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489.07370	147.06000	-R2.34G47	-69.09196
490.60309	150.0000	-97.09721	-53.74392
490.00000	160.97000	-101.07554	-36.76301
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490.30370	190.0000	-53.74702	00000
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500.03000	10.00036	-4354.37994	-97.36315
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510.0101	5ù.06°60	240.34602	-485.57356
510.07101	70.00000	191,76798	-526.87818
500.0000	80.1000	97.35315	-552.17388
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510.00000	110.0000	-191.76798	-526.37518
510.03033	120.00060	-280.34602	-485.57356
F00.00000	173.00000	-360.40500	-429.515 13
500.00000	147.00000	-429.51503	-360.40590
500.01000	150.00000	-485.573F6	
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                      50.00000
540.0000
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f?3.01)u^	150.00000	-577.73153	-210.27708
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549.01000	40.000c	19.19727	-501.97946
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66) . ይ ስ ግ ር ପ	50.0000	-236.43842	-307.92620
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66 G• 0 J G G G	170.36060	-395.66230	-69.90120
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59 û . û ~ 03 C	50.0000	-218.79071	-223.46497
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730.30740	159. 00000	-179.55562	-65.35290
	7 7 4 - 5460	4. 140.5141	A24 126 33

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920.03000	20.0000	-173.50420	-11.21026
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64 Û • J Ũ J Ú U	130.5500	-7.1558	. 0111
860.0000	3•	-5.61755	0.
860.00001	10.00000	-10.51173	53359
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<i>P</i> 6u.]]]]] ⁿ	117. EEG 0 G	-1.05396	-2.88749
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Pag. 03109	150.0000	J.	₽.
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050°03000	C.	Λ.	0.
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020.01390	20.00000	0.	ō.
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62 0. 00000	50.00000	0.	0.
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020.0000	80.2000	0.	0.
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960.00000	0.	r.	0.
950.01000	10.0000	0.	0.
960.03030	20.00000	•	9.
950.09900	30.5CBGC	0.	0.
960.0000r	40.0000	C •	3.
957.03707	50.0000	0.	0.
960.07000	60.06000	0.	0.
95 0 . 00000	70.00000	9.	0.
950.00376	90.00000	0.	0.
960.10330	90.00000	C.	9 ເ
950. cabbo	100.6CDGr	0.	C .
950.00103	110.00000	0.	0.
950.07000	126.00000	Ö.	0.
	130.90000	2.	0.
960.00000	140.00000	0.	0.
05 Q. H 3 Q J A	150.66378	0.	0.
960.00000	160.56700	0.	0.
960.07300	179.00000	0.	0.

050.30000	180.)[06]	0.	9•
o•j.89738	0.	-1.07845	0.
090,01000	10.0160	-3.15362	15563
990.30000	20.00300	-2.A3C19	30653
099.G17C[	30.00000	-2.35728	44512
<b>≎</b> ₹ 5. 70776	40.3(660	-1.78634	57609
0.0.01998	50.00000	-1.21121	68656
940 00000	50.00000	71798	
	-		7761F
990.8mj90	70.01366	36117	84219
093.03300	4P. C100°	<b>1</b> 4245	8826?
ლოც.ციუცი	90.3000	07100	89824
G8 G. G8233	190.0000	15567	88262
040.0113	110.00000	81653	94219
990.00000			
	120.0000	44912	77615
989.0700C	130.07300	57609	68656
989.30000	140.2000	f 3656	57609
649.00000	150.70000	77616	44512
994.00000	150.30000	84219	30653
9-1.00001	176.00600	89262	15563
947.20000	180.00300	44812	.00030
1079.03900	<b>3</b> .	-10.37692	0.
1200.00200	10.0000	-19.97166	985
1000.00016	20.00000	-17.92455	-1.34136
1000.00000	30.06647	-14,92046	-2.83808
1670.0000	49.0000	-11.31347	-3.64856
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1003.00300	6°.°°CC	-4.54722	-4.91570
1010.00000	73.05366	-2.29744	-5.33744
1030.90300	90.0000	90220	-5.58942
			11.11.7
1000.00707	90. 17000	-,44964	-5.67616
100.00000	100.06606	94565	-5.58992
10)0.0~989	110.05700	-1.04136	-5.33384
1000.00000	120.00.00	-2.63886	-4.91570
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	140.00000	-4.34819	
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1900.09000	150.00700	-5.33384	-1.94136
1000.00000	178.00000	-5.58992	98565
1000.00000	180.00003	-2.83*88	.00000
1029-01300	0.	-28,79509	0.
			- ·
1020.00000	10.60000	-54.65.28	-2,59758
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1020.0:300	40.00000	-30.96319	-9.98354
1020.03000	50.00000	-2ú.99439	-11.90030
1026.00970	50.00000	-12.44502	-13.45348
1020.00000	70.0000	-6.25036	-14.59788
1620.03100	89.70000	-2,46919	.15.29874
1020.00~35	90.0000	-1.27060	-15.53474
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1020.01003	119.00000	-5.31320	-14.59786
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			* : * : : : : :
1020.0000	130.00000	-9,94554	-11,90030
1023.03600	140.05060	-11.90030	-9.08554
1020.00000	150.0000	-13.65348	-7.76737
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1020.00000	170.60900	-15.29874	-2.69758
1020.00000	140.0000	-7.75737	.0003
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	-310.070		

431 6 6555			
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1050.00373			
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1060.0000	78.96066	-15.89169	+37.05617
1068.99300	AO. 00000	-6.26793	-38.33526
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160,00000	130.77060	-6.84778	-38.93526
1056.00000	110.30000	-13.48774	-37.15617
1960.00300	129.00000	-19.71718	-34.15115
1060.00000	136.05000	-25.34791	- <n.20847< td=""></n.20847<>
1060.00000	143.00063	-70.23847	-25.347 41
1957.99709	150.00000	+34.15115	-19.7171*
1650.03000	163.00003	-37.05617	-17.48734
1759.90000	170.00000	-30.87T24	-6.94779
1063.70000	180.00000		,0000-
1056.00909	e.	<b>-</b> 9 , 7 ,	₫•
1093.20200	10.0000	-160.79508	-4.32276
1043.00730	20.0000	-162.25439	~17.57442
1090.01001	30.0000	-135.15087	-25.69208
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1390.07760	60.0G0CC	-41.16429	-44.46998
1030.00000	70.5000	-29.70735	-48,28531
		-2.410103	2.7.2.2.2.
1080.01000		4 4 4 7 7 7 4	
	#u• ucdeu	-6,16731	-50.50351
1980.08909	30.30000	-8,16731 -4,07046	-50.50351 -51.7841F
	30.3000	-4.07046	-51. 7A41F
1030.2020	30.J0000 190.J000	-4.07046 -8.97276	-51.78416 -50.60351
1030.90303	30.3000	-4.07046	-51. 7A41F
1030.2020	30.J0000 190.J000	-4.07046 -8.97276	-51.78416 -50.60351
1030.90999 1050.0000 1058.0000	40.J0000 100.J0000 110.G0000 120.G0000	-4.07046 -8.9?276 -17.57442 -25.69208	-51.7841F -50.60351 -48.28531 -44.49998
1030.90999 1050.00000 1038.3000 1030.0000	30.J0000 100.J0000 110.G0000 120.G0000 130.C000	-4.07046 -8.9?276 -17.57442 -25.69208 -33.02510	-51.78416 -50.60351 -40.28531 -44.49998 -39.36255
1030.90999 1050.07000 1058.30007 1050.00030 1053.07030	40.J0000 100.J0000 110.G0000 120.G0000 130.G0000 140.90600	-4.07046 -8.97276 -17.57442 -25.69208 -33.02510 -39.36255	-51.78416 -50.60351 -48.28531 -44.49998 -39.36255 -33.12910
1030.90999 1050.00000 1038.3000 1030.0000	30.J0000 100.J0000 110.G0000 120.G0000 130.C000	-4.07046 -8.9?276 -17.57442 -25.69208 -33.02510	-51.78416 -50.60351 -40.28531 -44.49998 -39.36255
103 0.2000 105 0.0000 105 0.0000 105 0.0000 105 0.0000 105 0.0000	40.J0000 100.J0000 110.G0000 120.G0000 130.G0000 140.90600 150.G000	-4.07046 -8.97276 -17.57442 -25.69208 -33.02910 -39.36255 -44.49998	-51.78416 -50.60351 -48.28531 -44.49998 -39.36255 -33.12910 -25.69208
103 0.3000 105 0.0000 105 0.0000 105 0.0000 105 0.0000 105 0.0000 105 0.0000 105 0.0000	40.J0000 100.0C000 110.CC000 120.GC000 130.CC000 140.9C600 150.CC000	-4.07046 -8.97276 -17.57442 -25.69208 -33.02513 -39.36255 -44.49998 -48.29531	-51.78416 -50.60351 -48.28531 -44.49998 -39.36255 -33.12910 -25.69208 -17.57442
103 0.2000 105 0.0000 105 0.0000 105 0.0000 105 0.0000 105 0.0000 105 0.0000	40.J0000 100.0C000 110.CC000 120.GC000 130.CC000 140.9C600 150.CC000 150.CC000	-4.07046 -8.97276 -17.57442 -25.69208 -33.02513 -39.36255 -44.49998 -48.29531	-51.78416 -50.60351 -48.28531 -44.49998 -39.36255 -33.12910 -25.69208 -17.57442
103 0.3000 105 0.0000 105 0.0000 105 0.0000 105 0.0000 105 0.0000 105 0.0000 105 0.0000	40.J0000 100.0C000 110.CC000 120.GC000 130.CC000 140.9C600 150.CC000	-4.07046 -8.97276 -17.57442 -25.69208 -33.02513 -39.36255 -44.49998 -48.29531	-51.78416 -50.60351 -48.28531 -44.49998 -39.36255 -33.12910 -25.69208 -17.57442
103 0.2000 103 0.2000 1038.2000 1030.0000 1030.0000 1030.0000 1030.0000 1030.0000	40.J0000 100.J0000 110.J0000 120.G0000 130.CCOGO 140.J0600 150.CCOGO 150.CCOGO 170.GCOGO	-4.07046 -8.97276 -17.57442 -25.69208 -33.02513 -39.36255 -44.49998 -48.29531 -50.60351	-51.78416 -50.60351 -48.28531 -44.49998 -39.36255 -33.12910 -25.69208 -17.57442
103 0.2000 103 0.2000 103 0.2000 103 0.2000 103 0.300 103 0.300 104 0.200 104 0.200 104 0.200 104 0.200 104 0.200	40.J0000 100.0C000 110.CC000 120.GC000 130.CC000 140.9C60C 150.CC000 150.CC000 170.CC000	-4.07046 -8.97276 -17.57442 -25.69208 -33.02513 -39.36255 -44.49998 -48.23531 -50.60351 -25.69208	-51. T841 F -50. 60351 -48. 28531 -44. 49998 -39. 36255 -33. 12910 -25. 69208 -17. 57442 -92275 -50010
103 0.2000 103 0.2000 103 0.2000 103 0.2000 103 0.300 103 0.300 103 0.300 103 0.300 103 0.300 113 0.000 113 0.000	30.J0000 100.0C000 110.GC000 120.GC000 130.CC000 140.GC000 150.GC000 150.GC000 170.GC000	-4.07046 -8.97276 -17.57442 -25.69208 -33.02910 -39.36295 -44.49998 -46.29531 -50.69208 -115.78458 -222.84168	-51. T841 F -50. 60351 -44. 28531 -44. 49998 -39. 36255 -33. 12910 -25. 69208 -17. 57442 
103 0.2000 103 0.2000 103 0.2000 103 0.2000 103 0.300 103 0.300 104 0.200 104 0.200 104 0.200 104 0.200 104 0.200	40.J0000 100.0C000 110.CC000 120.GC000 130.CC000 140.9C60C 150.CC000 150.CC000 170.CC000	-4.07046 -8.97276 -17.57442 -25.69208 -33.02513 -39.36255 -44.49998 -48.23531 -50.60351 -25.69208	-51. T841 F -50. 60351 -48. 28531 -44. 49998 -39. 36255 -33. 12910 -25. 69208 -17. 57442 -92275 -50010
1070.70707 1080.07000 1088.20707 1080.00010 1080.0200 1080.0200 1080.0220 1080.0220 1080.0220 1080.0220 1180.0220 1170.0220	30.J0000 100.0C000 110.GC000 120.GC0GC 130.CC0GC 140.GCGGG 150.CCGGG 150.CCGGG 170.CCGGG 160.CCGGG	-4.07046 -8.97276 -17.57442 -25.69208 -33.02910 -30.36255 -44.4998 -48.29531 -50.60351 -25.69208 -115.78458 -223.84168 -200.00030	-51. TA41F -50.60351 -48.28531 -44.49998 -39.36255 -33.12910 -25.69208 -17.57442 -29.275 -00010
103 0.3 n303 105 0.0 n000 105 0.0 n000 105 0.0 n000 105 0.0 n000 105 0.0 n000 105 0.0 n300 105 0.0 n300 117 0.0 n000 119 0.0 n000 110 0.0 n000	30.J0000 100.J0000 110.J0000 120.J0000 130.J0000 140.J0000 150.J0000 150.J0000 10.J0000	-4.07046 -8.97276 -17.57442 -25.69208 -33.02910 -30.36255 -44.4998 -48.23531 -50.60351 -25.60351 -25.60351 -222.84168 -200.00030 -166.53130	-51. TA41F -50.60351 -44.28531 -44.49998 -39.36255 -33.12910 -25.69208 -17.57442 .00010 0. -10.99783 -21.66149 -31.66698
103 0.3 n303 105 0.0 n000 105 0.0 n000 105 0.0 n000 105 0.0 n000 105 0.0 n000 105 0.0 n000 115 0.0 n000 115 0.0 n000 115 0.0 n000 110 0.0 n000 110 0.0 n000	30.J0000 100.J0000 110.J0000 120.G000 130.CCOGO 140.J000 150.CCOGO 150.CCOGO 150.CCOGO 150.GCOGO 10.GCOGO 30.GCOGO	-4.07046 -8.97276 -17.57442 -25.69208 -33.02513 -30.36255 -44.4998 -48.29531 -50.60351 -25.69208 -115.78458 -200.00030 -166.53130 -126.23454	-51. TA41F -50.60351 -44.28531 -44.49928 -39.36255 -33.12910 -25.69208 -17.57442 
103 0.3 n303 105 0.0 n000 105 0.0 n000 105 0.0 n000 105 0.0 n000 105 0.0 n000 105 0.0 n300 105 0.0 n300 117 0.0 n000 119 0.0 n000 110 0.0 n000	30.J0000 100.J0000 110.J0000 120.J0000 130.J0000 140.J0000 150.J0000 150.J0000 10.J0000	-4.07046 -8.97276 -17.57442 -25.69208 -33.02910 -30.36255 -44.4998 -48.23531 -50.60351 -25.60351 -25.60351 -222.84168 -200.00030 -166.53130	-51. TA41F -50.60351 -44.28531 -44.49998 -39.36255 -33.12910 -25.69208 -17.57442 .00010 0. -10.99783 -21.66149 -31.66698
1070-70707 1080-70707 1080-70707 1080-7070 1080-70707 1080-70707 1080-70707 1170-70707 1170-70700 1100-70700 1100-70700	30.J0000 10n.J0000 110.G0000 120.G000 130.C000 140.G000 150.C000 150.C000 170.G000 170.G000 10.GC000 30.G0000 40.G0000	-4.07046 -8.97276 -17.57442 -25.69208 -33.02510 -30.36255 -44.49588 -48.23531 -50.60310 -25.63208 -115.78458 -220.6030 -166.53130 -166.23454 -85.59251	-51. 7841F -50.60351 -44.28531 -44.49998 -39.36255 -33.12910 -25.69208 -17.57442 
1070.70707 1080.0000 1080.0000 1080.0000 1080.0000 1080.0000 1080.0000 1080.0000 1170.0000 1100.0000 1100.0000 1100.0000	30.J0000 100.J0000 110.J00000 120.G0000 130.CCOGC 140.JCGGC 150.GCGGG 150.GCGGG 150.GCGGG	-4.07046 -8.97276 -17.57442 -25.69208 -33.02510 -30.36255 -44.4998 -48.29531 -50.60351 -25.69208 -115.78458 -220.60130 -166.23454 -85.59251 -50.73738	-51. 7841F -50. 60351 -44. 28531 -44. 49998 -39. 36255 -73. 12910 -25. 69208 -17. 57442 
103 0.3 n303 105 0.0 n000 105 0.0 n000 105 0.0 n000 105 0.0 n000 105 0.0 n000 105 0.0 n000 1170.0 n000 1100.0 n000 1100.0 n000 1100.0 n000 1100.0 n000 1100.0 n000	30.J0000 100.J0000 110.J00000 110.J00000 130.CCOGT 140.JCGOC 150.CCOGT 140.JCGOC 150.CCOGT 170.OCOGT	-4.07046 -8.97276 -17.57442 -25.69208 -33.02510 -39.36255 -44.49598 -48.29531 -50.60351 -25.69258 -115.78458 -200.05130 -166.23454 -85.59251 -50.73738 -25.52301	-51. 7841F -50. 60351 -44. 28531 -44. 49998 -39. 36255 -33. 12910 -25. 69208 -17. 57442 -27. 60000 0. 99783 -21. 66698 -48. 516628 -54. 84882 -59. 51445
1070.70707 1080.0000 1080.0000 1080.0000 1080.0000 1080.0000 1080.0000 1080.0000 1170.0000 1100.0000 1100.0000 1100.0000	30.J0000 100.J0000 110.J00000 120.G0000 130.CCOGC 140.JCGGC 150.GCGGG 150.GCGGG 150.GCGGG	-4.07046 -8.97276 -17.57442 -25.69208 -33.02510 -30.36255 -44.4998 -48.29531 -50.60351 -25.69208 -115.78458 -220.60130 -166.23454 -85.59251 -50.73738	-51. 7841F -50. 60351 -44. 28531 -44. 49998 -39. 36255 -73. 12910 -25. 69208 -17. 57442 

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1100.77375	<b>∿9• ~ [^€</b> 6	-5.01708	-67, 33396
1190.00000	109.9000	-10.99783	-62,37177
1103.03303	110.00000	-21.66149	-59.51445
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1120.000	90.0000 130.3000	-13.07289	-74.14007
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1120.90900	170.00000	-74 . 14 Pû 3	-13.07289
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1149.00300	0.	-159.47688	0.
114 0.0 7000	10.0000	-316.93288	-15.14705
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1143.00000	30.00000	-229.44217	-43.61678
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1140.03700	50.60000	-117.89157	-56.32479
114 9. 00000	53.00000	-69.88356	-75.54648
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1149.93930	99.01968	-13.86543	-85.98329
116 8. 8 7 7 7 7	90.CC000	- <del>6</del> • 91 0 32	-87.23357
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1130.00700	51.10000	-150.19063	-85.13295
1190.00000	sc.oracc	-89.02974	-96.24415
		:	
1180.07037	77.31000	-44.79566	-104.43132
1190.07030	87.0000	-17.66418	-139.44451
1159.09900	90900.00	-8.83356	-111.13317
1140.03000	130.00000	-19.29817	-109.44481
1139.00000	110.30000	-78.09978	-104.43192
1150.05000	156.00360	-55.56659	-96.24415
1190.07009	130.2009	-71.43503	-85.13295
1190.03000	140.0000	- 35.13295	-71.43593
1193.07936	150.00000	-9F.24415	-55.56659
			-38.20978
1190.90000	160.00000	-104.43102	
1130.07300	179,60006	-109.44481	-19.29837
1190.07300	187.00060	<b>~55.56659</b>	.00000
1200.30000	٠,	-225.01572	0.
1200.0000	10.3000	-433.06968	-21.37313
	27.00000		
1230.2000		-389.67982	-42.09686
1200.00000	3~.3000	-323,73347	-61.54149
1270.97070	40.0000	-245.32373	-79.11621
1200.00000	51.0000	-166.34016	-94.28703
1200.0000	50.00000	-98.60283	-106.59298
	11 1111		
1230.0000	70.3000	-49.53132	-115.66116
1238.03960	<b>83.</b> 0000	+19,56355	-121.21307
1200.03000	<u> </u>	-9.75017	-123.08298
1239.09900	187.3000	-21.37313	-121.21707
1263.00000	110.0000	-42.89566	-115.66016
		· · ·	
1238.0676*	120.0000	-61.54149	-106.59298
1290.93737	130.6000	-79.11621	-94.28793
1293.83000	140.0000	-94.28703	-79 · 115? <b>1</b>
1230.03390	150.86000	~106.59298	-61.54149
1260.01390	160.0000	-115.55716	-42.09686
1200.00000	170.0006	-121.21307	-21.37313
1270.81.300	193.66760	-61.54149	.03060
1220.00800	0.	-246.86147	9•
1220.03930	10.06020	-475.11528	-23.44820
12203703	23.00000	-426.41573	-46.18393
1270,03037	30.0000	-355.16391	-67.51639
1227.09600	49.0000	-269-14156	-86.79740
1220.07300	50.000C	-187.49969	-103.44111
1250.60306	<b>~3.0000</b>	-105.17592	-116.94182
1229.00200	79.00000	-54.41698	-126.88931
1223.03303	90.0000	-21.46293	-132.98173
12?0.00000	90.0000	-10.69679	-135.93278
1220.00000	100.0000	-27.44820	-132.98133
1227.33307	110.0000	-46.18393	-126.98931
1220.0333	120.3000	-67.51639	-116.94182
1220.00000	137.06360	-56.79740	-103.44111
		• • • • •	
1220.00000	140.0000	-103.44:11	-86.79740
1220.07090	150.0000	-116.94182	-67.51639
1220.00300	160.07009	-126.88931	-46.18393
1220.37930	170.500G	-132.98133	-23.44820
1220.00033	199.66069	-67.51639	. 00200
707 49 446 29	73308606	201927624	-9 0 0 0 0 0

1240.00000	ù •	-268.7076?	0.
1240.07376	13.00000	-517.16C88	-25.52326
1243.07932	24.0000	-464.151F3	-50.27100
1240.00000	30.0036r	~396.59434	-73.49120
1240.0000	43.0°00°	-292.95940	-94.47858
1249.30930	50.000CC	-195.63923	-112.59519
1240.07030	60.0CC1C	-117.74501	-127.29365
1740.70316	78.80 <b>6</b> 6	-50.23265	-138.11945
1240.63378	*8.C0060	-23. 76730	-144.74959
1240.00000	90.3006	-11.64341	-146.98?58
1246.00000	170.00365	-25.52326	-144.74959
1248.00000	110.3000	-5C.2710J	-138.11545
1240.03200	120.GLP6C	-77.49129	-127.29365
1243.37339	130.00000	-94.47853	-112.59519
1240.00000	143.06668	-112.59519	-94.47858
1249.07000	150.00000	-127.29065	-73.49129
1240.07070	150.5006	-138.11845	-50.27100
1247.53350	176.3666	-144.74959	-25.523?6
1249.09370	187.00840	-73.49129	. 00000
1260.03700	0.	-290.55377	0.
1250.07733	13.55330	-550,23647	-27.59832
1250.09390	20.00000	-501.89754	-54.35308
1263.00700	33.00700	-418.C2477	-79.46619
1750.07170	4°.2000	-316.77724	-102-15977
1267.70000	5%.00000	-214.73876	-121.74927
1269.73007	60.0000	-127.32810	-137.63948
1260.03000	78.36066	-64.54831	-149.34759
126 0. ~ 3 ~ 6 ~	50.97600	-25.26167	-156.51785
126 0 . 0 . 0 . 0 . 0	99.2000	-12.59003	-158.93230
1253.07930	170.00555	-27.59A32	-156.51745
1758.03003	110.0000	-F4.35803 -70.45610	-149.34759
1260.00000	120.90300	-79.45£19 -102.15077	-137,63948
1250.01030	130.00000 143.0000	-102.15977 -121.74927	-121.74927 -102.15977
1260.0334° 1250.03304	150.0000	-137.63948	-79.46619
1250.03300	163.00063	-149.34759	-54.35808
1262.03070	170.00000	-156.51785	-27.59832
126 0. 00000	183.00000	-79.45619	.0000
1230.0000	9.	-312.39991	7.
1293.00000	16.30300	-501.25247	-29.67338
1240.07360	29.30000	-539.62344	-58.44515
1230.07570	39.00000	-449.45521	-85.44110
124 7. 00000	40.000.0	-340.59508	-109.84096
1290.07370	50.7000	-230.07#29	-130.90335
1280.23000	50.000úc	-136.89519	-147.98832
1296.00000	70.01000	-F8.86397	-160-57673
1283.33330	80.30000	-27.16105	-168.28611
1230.67996	90.0000	-13.53665	-170.98219
1240.07000	100.0000	-29.67338	-168.28611
1259.00000	110.00009	-58.44515	-150.57673
1290.00000	120.07360	-85.44110	-147.98832
1290.07000	130.0000	-109.84396	-130.90335
1240.03700	140.5000	-130.00735	-139.84896
1240.00000	150.0000	-147.98832	-8°.44110
1240.00000	160.0000	-160.57673	-58.44515
1240.00030	170.30000	-168.29611	-29. 77338
1290.0000	187.00000	-#5. <b>4411</b> 0	.00000
1330.00000	ů.	-334.24606	0
1300.00000	10.00000	-643.29767	-31.74844
1333.07337	20.0000	-577.35935	-62.53222
1370,00000	30.0000	-480.68564	-91.41600
1370.73037	47.0 CGC C	-364.41292	-117.52214

1700.00000	50.01060	-247.03782	-140.35743
1733.07030	51.0000	-146.45828	-158.77715
1336.50000	77.3690	-73.67963	-171.805 ER
1370.07700	30930.05	-29.06042	-190.05437
1300.07000	90.0807G	-14.43727	-182.33159
1300.00000	100.00000	-71.74844	-182.05437
			-171.80588
1708.77700	113.05609	-62.53222	
1300.00000	120.0000	-01.41600	-158.33715
1700.00736	130.36066	-117.52214	-140.95743
1330.00000	140.00000	-142.05743	-117.52214
1313.01000	15	-158.33715	-91.41670
1700,0000	150.0000	-171.80585	-62.53222
1330.00000	170. 10000	-180.05437	-31.74844
1770.07170	180.0000	-91.41600	• 00006
1370.0000	C •	-356.C9?21	٠.
1320.06707	10.0000	-685.34327	-32.82350
1329.20000	73.50006	-615.09525	-66.61930
1320.00000	30.0000	-512.31608	-97.39090
1320.07770	40.5606	-38A.23n75	-125.20333
1323.00000	50.0000	-263.23735	-149.21151
1320.0000r	53.00000	-156.04138	-168.68590
1720.01709	76.26060	-78.49530	-183.03502
1720.00070	93.0200°	-30.95980	-191.82262
1320.00109	96.01969	-15.42989	-194.78180
13?0.0590^	130.00009	+33.82350	-191.92762
1320.70300	110.00600	-66.61939	-183.03502
1370.00000	120.00000	-97.39090	-166,68599
		* * * * * * * * * * * * * * * * * * *	
1727.76300	136.0000	-125.20333	-149.21151
1320.01000	140.00000	-149.21151	-125.20333
1323.00000	150.66866	-168.63599	-97.39090
1326.61761	150.62700	-183.03502	-66.51930
1320,00930	170.00000	-191. #2262	-33.82350
1320.07000	180.6000	-97.39190	. 30000
1740.07300	₹•	-377.93836	₿•
1340.00000	10.0000	-727.39887	-35.89857
1340-60000	20.0000	-552.83116	-70.70537
1346.07900	37.2000	-543.74651	-103.36580
134 C. 03 000	40.65000	-412.04659	-132.88451
1340.03907	50.00000	-279.38588	-158.36559
1340.00999	60.0000	-165.61447	-179.03482
1340.07703	70.3000	-83.31096	-194,?6416
1340.05000	80.0000	-32.85917	-203.59038
1340.70330	90.0000	-16.37651	-206.73160
		12772.12	
1749.03000	100.00000	-35.89857	-207.55088
1349.00000	110.0000	-70.70E37	-194.26416
1340.00909	120.8000	-193.86580	-179.13482
1340.00000	130.0000	-132.63451	-158.36559
1340.01999	140.00000	+15*.36559	-132.88451
1340.00000	150.00000	-179.03482	-103.36580
*340.09199		-194.26416	-70.70637
	160.00000		
1340.00000	170.0C0Cö	-203.59088	-35.89857
1340.00000	180.0000	-103.36569	.00000
1360.07000	ð.	-399.78451	9.
1360.00000	10.0000	-759.47447	-37.97363
1360.07000	20.0000	-690.56706	-74.79745
	21::::::::		
1360.00000	31.0000	-575.17695	-109.34070
1360.00360	40.0000C	-435.86643	-140.56570
1360,00000	50.0C70G	-295.53641	-167.51958
1760.07000	60.2000	-175.18756	-189.38365
136 3. 00000	70.0000	-88.12662	-205.49370
1350.00330	80.0000	-34.75855	-215.35914
1700.0000			
1 -049 010 .A	99.0000	-17.32313	-218.68141

1760.0000C	170.0000	+37.07363	-215.35914
1350.00007	110.00000	-74.79345	-205.49330
1369.70037	120.00000	-109.84370	-190. 78765
1350.03001	130.0000	-140.56570	-167.51968
		7.227.27.2.7	
1760.0000	146.0000	-167.51.9F8	-140.55570
136 0. 00000	150.0000	-189.38365	-109.34070
1350.00000	160.5000	-205.49330	-74.79745
1360.07001	177.5005	-215,85914	-37.97363
1367.0300	189.30000	-109.34076	.00000
1390.07000	n.	-421.63065	7.
1391.03000	10.0000	-811.49007	-40.04869
1350.00030	30.0000	-728.30297	-78.84052
1793.00030	30.000	-606.60738	-115.31560
1390.03000	40.0000	-459.63427	-148.24688
1390.00070	59.0C0CC	-311.69594	-176. <i>€</i> 7376
1780.0000	60.0000	-194.76065	-199.73249
1340.23980	70.4666	-92.94228	-216.72245
1340.00000	80.00000	-36.65792	-227,12740
1390.00000	90.6000	-18.25974	-230.63121
1330.0000	100.40900	-40.04869	
			-227.12740
1390.00000	110.0000	-78.84052	-216.72245
1393.00700	120.50300	-115.31560	-199.73249
1390.00000	130.57660	-148.24688	-176,67376
1349.00000	149.00360	-176.67376	-148.24688
1330.00000	150.6000	-199.73249	-115.31560
1350.03000	160.00000	-216.72245	-73.88052
1348.67990	170.96000	-227.12740	
			-40.04869
1330.07000	187.00000	-115.31560	. 23837
1436.30337	7•	-443.47580	<b>.</b> .
1430.00909	19.C(00r	-853.52567	-42,12375
14~9.30976	2°.66860	-764.83887	-82.96759
1400.06000	30.00000	-638.03761	-121.29051
1430.02220	43.00000	-483.50210	-155.92807
1490.03700	50.30000	-327.83547	-185.32764
1498.69993	63.0000	-194.33374	-210.06132
1439.07000	70.00000	-97.75795	-227.95159
1476.00007	80.2000	-38,55729	-238.89566
1479.90990	90.0090	-19.21636	-242.58101
1490.03390	196.0000	-42.12375	-235.89566
1420.20700	119.30560	-82.96759	-227.95159
1400.00000	120.0000	-121.29051	-210.7813?
1400.09370	130.000Gr	-155.92807	-185.82784
1470.73030	and the second s		
	147.0000	-135,82784	-155.92507
1400.07000	150.00000	-218.08132	-121.29051
1400.3077	163.0000	-227, 951,;9	-82.96759
1410.01000	170.00000	-238.89566	-42.12375
1430.03700	19~.80030	-121.23051	.00000
1423.00000	Ç.	-277.19594	0.
1473.30037	10.00020	-437.27424	-21.53064
1420.03339	20.0000	-392.45341	-42.50556
	33.00000	-326.87652	_
1420.00000			-62.13395
1423.00000	40.0000	-247.70551	-79.88433
1420.09390	57.0000	-167.95512	-95.20244
1427.83707	60.0000	-90.56014	-107.62787
1420.00000	70.0090	-59.08289	-116.78308
1420.00000	80.0000	-19.75349	-122.38990
1429.00000	93.0008	-9.84484	-124.27796
1420.00000	100.00000	-21.53764	-122.38990
1420.00707	117.00000	-42.90556	-116.78398
1420.00000	120.0000	-52.13898	-107.62787
1420.00000	1300000	-79.88433	-95.20244
1420.00000	140.0000	-95.20244	-79.88433
1420.00000	150.00000	-107.62787	-62.13898
14?0.90000	160.0000	-115.79308	-42.50556
1420.09000	170.00000	-172.78590	-21.58064
1420.03700	180.0000	-62,13498	.00000
	150,000	- 0.5 4 T 0.5 30	******

LISTING OF NET NORMAL AND TANGENTIAL LOADS FOR EXAMPLE PROBLEM 2

STVL= 276422.75	STVLXC=	139477319.76	S?TVL=	452845.89	CP=	616.00
хССФЭ	ላቦ (የደሳ		AML	ATTL		
••		).	ą.		0.	
•		30060	G.		0.	
0.		2.6000n	Q.		0.	
<b>9.</b>		5. 0 CO G @	9.		0.	
0.		1.9666	Q.		0.	
3.	-	5 <b>.0</b> 0000	G.		9.	
9.		0.0000	G.		0.	
Ç.◆	34	5. CC6 CG	٥.		9.	
9.	41	?.0C00G	۵.		0.	
a.	49	s. ccase	<b>0</b> •		0.	
9∙	51	. 20086	0.		0.	
٠,	51	5.00000	0.		9.	
3.•	60	3.200c	0 •		0.	
0.	65	s.ctoec	0.		0.	
G.	7(	0. 26063	ۥ		0.	
ე.	79	5.0000	0.		0.	
0.	81	. ccacc	9.		0.	
0.	35	5.0C00G	<b>c.</b>		0.	
٠.	31	0.0000	0.		C.	
17.40000		i •	0.		0.	
17.40000	•	. 00000	n.		C.	
17.49306	10	0.0000	0.		0.	
17.49300		5.3000	0.		0.	
17.40003	26	.00000	0.		e.	
17.47000		5. 3 00 00	0.		0.	
17.47000		. 0 0 0 0	0.		0.	
17.49000		. 00000	ů.		C.	

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17.40303	40.0000	٠.	е.
17.47003	45. CC0CC	0.	0.
=	•	Ü.	0.
17.40907	57.00000	_	
17.43377	55.300cr	C •	7.
17.43200	50.00000	٠.	G.
17.40000	65.00000	G.	0.
17.40303	79.8669	७.	0.
		3.	
17.40709	75.00060		ċ.
17.40000	81.01000	C •	€.
17.47370	45.00000	9.	8•
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17.40323	90.0000	Û •	ũ•
34.8370*	<b>3.</b>	0.	9.
			-
74.2000C	5.CC0GC	₽•	٠.
34.87000	19.20000	0.	0.
74.50333	15.6 [686	C.	0.
34.97000	20.07000	0.	0.
34.60333	25.00000	0.	0.
34. 81737	₹₽. ££6€8	J.	€.
74.9933	₹ <b>5.</b> 30000	<b>€.</b>	0.
	60 00000	0.	0.
74.50337	40.0E08C		
34.80730	45° 60° 60	0.	Ü.
34.40000	50.00000	<b>n</b> .	0.
34.83389	55. CC00r	3.	û.
34.80000	~ ~ ~ C 9 O G	0.	0.
34.8,330	55,00000	0.	9.
34.80303	73.9 CAGC	0.	
34, 49991	75.30300	r.	0.
34.80000	70.0700C	C •	C.
34.80300	85.ºC000	0.	0.
<del>-</del>			
34.87000	20.0000	3.	0.
52.23300	9.	0.	0.
52.20000	5.30000	0.	0.
			_
52.23336	10.0000	0 •	0.
52.20000	15.8C0GC	0.	9.
		_	_
52.20700	20.30060	0.	r.
52.27000	25.00000	0.	0.
52.2)000	39.60900	C.	0.
52.20006	<b>75. 000</b> 00	<b>0</b> •	0.
52.20000	4º.000C0	0.	0.
	•		
52.2000	45.0C000	ō•	0.
52.2000	50.0000	<b>e</b> •	<b>0</b> •
52.23000	55.000CB	0.	0.
			_
52.20100	67.J(CEP	<b>3.</b>	9.
52.27600	65.90000	ŋ.	9.
52.20720	79.00009	C.	0.
<2.2380C	75. C(00°	7 •	0•
52.20300	80.70000	0.	0.
52.2000	95.00000	0.	9.
52.20000	99.75960	9.	€ •
59.69730	2.	0.	0.
59.60000	5.00000	0.	0.
69.60000	10.0000	Ç.	9.
59.60000	15.00000	ő.	ō.
• •			
69.67300	29.000CP	¢.	0.
69.67300	25.00000	<b>r.</b>	0.
69.60909	30.0C0C0	C.	<b>e.</b>
69.50000	35.00000	G •	0.
69.50000	40-55055	0.	Ĉ.
	1 1 7 7 7 7 7		
69.60085	45.005DC	η.	0•
59.63000	50.0000	G•	0.
69.60000	55.0000C	0.	0.
69.69000	60.0T000	0.	0.

59.6°130	65.00000	Ç.	3.
69 <b>.</b> 6033?	70.00000	g.	Q.
69.68303	75.46968	r.	e.
59 <b>.</b> 60~~0	AG. 000CC	0.	0.
59.61009	<b>95.</b> 90200	· •	ŋ.
69.633ur	თო.ცეგოე	0 •	€.
97.88945	ũ•	0.	9.
87.09935	5.00000	<b></b>	Э.
97.01300	10.05055	ŋ <b>.</b>	?.
97.00000	15.00000	C.	û.
47.00000	20.46340	r.	0.
37.73730	25.00000	€.	9.
87.00000	30.60000	6.	0.
87.97300	35.00000	C •	C.
97.03031	40.0000	D •	ç.
87.0000°	45. CC0 J C	G.	٥.
97.030°J	50.00000	<b>~</b> •	9.
97.00000	55.°CC00	ũ •	0.
47.63Cg^	50.00000	C.	9.
97.3903*	<b>55.000</b> 00	r.	C.
97.0000	70.0C0nc	0.	٩.
47.0990r	75.00000	8.	٥.
87.67300	83.5C0&C	0.	0.
37.00000	35.GC000	· •	ũ.
97. 00000	96.46866	0.	9.
134.40000	ۥ	r,	9 .
134.40000	5.00000	Ū•	C.
194.40000	10.50000	C. •	G.
134.40300	15.06?60	0 <b>.</b>	0.
134.4.000	27.00000	Q.	0.
104.40000	25.3000	Q.	0.
134.47700	30.00000	0.	C.
134.40937	35.0000C	<b>0</b> •	2.
174.40700	40.000C	Q •	9.
134.43700	45.0000	Q.	0.
104.49909	50.0000	Q •	٥.
134.40909	55.00300	0.	0.
194.43333	60.3000	<b>a.</b>	Ç.
124.43300	65. CCSCC	<b>0</b> •	0.
134.40000	70. jcrla	0.	0.
134.47007	75.0000	C.	0.
194.43039	30.00000	C •	3.
104.40000	85.0000	c.	0.
134.43000	90.0000	0.	0.
121.83067	0.	3.	0.
121.80967 121.87907	5.0000	ς. •	9.
	10.04390	0.	n.
121.803% 121.80006	15.0000 20.0000	0. 0.	3.
121.89776	25.0C00C	0.	C.
121.50000	30.6(060	0.	0.
121.80302	35. ? COCC	· · · · · · · · · · · · · · · · · · ·	0.
121.800GS	4C.3C00"	0.	0.
121.0000	45.30000	0.	3.
121.50720	50.0000	0.	9.
121.80086	55. £600c	0.	0.
121.89300	60.00000	0.	9.
121.40000	65.00006	8.	0.
121.83089	70.00967	0.	0.
171.97300	75.00000	C.	0.
121.97000	30.00000	0.	Ğ.
121.20300	55. ú CO G C	0.	g.
		<del>-</del> -	

121.50130	90.10360	0•	0.
139.20110	<b>?.</b> •	9.	0.
139.27996	5.36000	0•	0.
179.23007	10.0000	টু •	0.
139.2000	15.00000	0.	0.
139.27000	20.0000	0.	<u>C</u> •
139.2330	25.00000	2.	G.
170,20100	30.********	0.	0.
139.20000	35.00000	7.	0.
149.2770	46.3F30C	9•	0.
139.20000	45.00úGC	<b>G</b> •	Ç.
159.20000 139.20100	50.00000 55.00000	G.	0 •
130.23103	60.00000	0.	0.
139.20000	65.9EGGC	0.	0.
139.20000	70.00000	0.	0.
139.20000	75.00000	û.	0.
179.20000	07010.08	ñ.	0.
130.20300	95.00000	J.	0.
130.20000	90.6600	0.	0.
156.60000	0.	0.	0.
156.63707	5.00000	0.	0.
156.60730	13.00011	9.	0.
156.600°C	1=.ucocc	ۥ	0.
156.62000	20.0000	₹•	0.
156.60000	25.00000	<b>n</b> •	۰.
156.60000	30.0000	0.	0.
156.60373	35. JEQLQ	? •	0.
156.60300	40.00000	0 •	0•
156.67900	45.96306	0.	0.
156.60300	50.0000	<b>.</b>	0.
156.5"90"	55.0C0CC	Ç.	Ç.
156.63030	60.0000	0.	G.
155.60000	65.00000	9•	0.
156.60:00	70.97000	0.	0.
156.60000 156.60000	75.00000 30.0000	0. 0.	0 • 0 •
136.60000	*5.000ce	0.	0.
156.61370	90.0000	ő.	0.
174.00030	0.	r.	0.
174.00000	5. Graca	ð <b>.</b>	0.
174.60000	19.66868	Ĉ.	ũ.
174.01000	15.00000	2.	0.
174.03000	20.30000	Ø •	8.
174.00030	25.00000	c.	0.
174.00730	30.00000	0.	0.
174.03006	35.0C0GC	<b>0</b> •	0.
174.03000	40.00000	C.	G •
174.07370	45.2000	7.	0.
174.00000	50.00000	<b>ું</b> •	0.
174.00000	55.GCCCC	C.	0.
174.00000	60.0000	· ·	0.
174.00039	65.00000	f.	ē•
174.07700	70.00000	0.	0.
174.03030	75.0000	0 • ^ •	0.
174.00945	90.00000 es.0000	"• 0•	0 •
174.73300 174.03360	95.00000 90.00900	ο,	0.
191.43300	0.	0	0.
191.40000	5.0000C	0.	£.
191.43300	10.00000	<b>₽</b> •	0.
131.47330	15.00000	2	0.
		₩ ₩	<b>.</b>

191.49999	20.0000	C •	0.
191.43330	25.00000	0.	0.
191.47530	33.00300	Ç.	0.
171.48935	35.00000	₹.	9.
191.40000	40.00800	0.	0.
191.4000	45.51000	0.	0.
131.60037	50.00ù00	ۥ	0.
171.40337	55.JCCCC	0.	0.
191.46398	60.0000	C.	9.
191.43060	65. ~ (000	C •	
			2.
191.47930	70.01000	C.	7.
171.43907	75.00300	0.	٠,
191.47636	90.0000	0.	0.
191.40737	55.00900	g.	0.
191.47100		c.	9.
	92.9880	· -	
238.80000	^•	ο.	0 •
238.83300	F.0000	C •	ũ.
208.51000	10.0000	0.	0.
298.84207	15. J (J û C	0.	0.
208.80030	S. 6000L	0.	0.
215.40000	?5.CC3CG	2.	9.
278.80330	30.000C	9.	0.
205.87930	35.00000	0.	o.
238.93007	40.0000	<b>6</b> •	٥.
208.80000	45.00000	9.	0.
238.40070	50.00160	0.	0.
208.89939	55.00000	C •	0.
519,80000	50.00101	C.	9.
218.8330r	55.0C70C	0.	0.
206-80990	70.00000	C •	0.
238.80000	75.00386	0.	0.
208.80009		0.	0.
	50.07006	=	
208.80020	85.Cr000	<b>c.</b>	0.
239.80030	90.00000	0.	0.
226.20330	6.	0.	0.
226.20330	5.0000	0.	0.
226.20900	10.00000	0.	Č.
225.20000	15.0000	0.	0.
226.21339	20.00000	ۥ	0.
226.27000	25.00000	0.	7.
225.23000	30.00000	0.	0.
226.20Jun	35.0000	-	
		यु•	0.
226.29890	49.66666	9 •	0.
725.20000	45.0000	0.	0.
235.23030	30.0000	0.	0.
226.20989	55. u CO Q Q	0.	0.
226.2000	60.0000	G.	0.
226.20070	65.00000	0.	8.
276.20998	70.00000	₽.	0.
225.21000	75.0000	0.	0.
225.2000	80.00040	_	
		0.	0.
226.20000	85. 66000	0.	9.
226.20330	90.0000	0.	0.
243.60300	0.	0.	ņ.
243.67079	5. 000CC	0.	O.
243.60000			
	10.0000	0.	٥.
243.50990	15.0000	0.	٥.
743.60000	20.26000	C.	9.
243.60000	25.0000	0.	0.
243.60000	30.6000	0.	o.
24 3 . 6 0 0 0 0			
	35.0000	0.	0.
247.5000	40.00000	0.	0.

243,50000	45.00000	0.	0.
243.60100	50.00000	0.	7
247.63732	55.00000	9.	O.
	60.00000	0.	3.
243.60000 243.60000		C •	7.
- · · • - · · · · · · · · · · · · · · ·	55.0(330		_
243,63000	70.01030	ŋ •	0.
243.63000	75.0000	0.	0.
243,60101	99.010GT	0.	0 •
243.6703°	85.00000	o •	C •
243.60000	90.06986	0.	7.
251.00330	0.	₹.	0.
251,00070	5.00000	C •	9.
251.00000	10.70000	J.	7.
251.97370	15.00000	7.	0.
251.02023	20.00007	0.	c.
251.00200	25.00000	0.	0.
251.00100	30.00000	·	7.
261.00000	35.30000	ñ •	•
	40.00000	<b>C</b> •	0
251.33330			
25 1. 00000	45.00100	0.	0.
231.07207	53.3000	0.	9.
261.00000	55.00000	Ç.	G •
261.00300	50.0000	n •	0.
261.37078	65. º 03 û ç	3.	3.
251.0300°	79.30000	C •	e •
251.39900	75.0000c	C •	3.
25 1 . 9 0 0 7 0	33.00000	C •	0.
251.01000	85.06069	0.	9.
251.00300	90.0000	C •	S .
278.43300	9.	n.	G.
274.40304	5.00000	0.	0.
278.40300	10.0000	0.	G.
278.47900	15.00000	0.	7.
278.43000	23.6600	C •	0.
278.43999	25.00000	0 •	0.
278.47900	30.00368	0.	0.
278.40300	35.00000	0.	0.
278.40000	40.00000	0.	c.
278.40000	45.6000	9•	0.
27*.4700?	50.00000	0.	0.
278.46707	55.0C000	n.	Ö.
			0.
274.4379 n	60.0000	0.	
274.42307	55.CCCC	0.	0.
279.47000	79.00000	0.	9.
278.40300	75.00000	n.	0.
278.40007	30.000	7.	0.
278.49000	95.00000	₽•	7.
278.49909	90.6000	0.	ů.
235.80700	0.	<b>0</b> •	0.
295.40000	5.0000	ū •	0.
295.8C000	18.50067	Q •	0.
295.80900	15.0000	0.	0.
295.49390	~0.0C00r	ņ.	0.
275.8330"	25.00000	0.	0.
295.8 1901	77.08000	0.	0.
295.80300	35.00000	Ĉ •	0.
295. = 033 C	40.00700	0.	0.
235.50000	45.00000	J.	0.
235.4000	50.00000	0.	0.
295.80000	55.00000	c.	0.
295.83000	50.4000	0.	0.
295. # 100r	65.000cn	0.	8.
		• •	

295.83338	70.00000	e •	0.
295.80000	75. CCGCC	à.	2.
295.40010	99.0000	0.	ů.
295. 90300	85.00000	8.	č.
235.80000	90.00000	Ç.	ő.
		· •	
313.2000	û. E asnan	ç.	8.
34 3. 2 1 B n n	5.0000	2.	0.
313.27373	10.0000	ŗ.	ũ•
313.20000	15.86766	<b>0</b> •	0.
713.20000	30.0000	0.	Ç•
713.23707	25.00000	<b>9.</b>	ç.
373°50404	30.0000	ۥ	Ç.
313.20100	35.2F0CC	ۥ	0.
31 3.20010	40.0(G&C	G.	0.
313.2010	45.GC869	3.	٥.
313,20000	50.0CGCC	P .	C.
713.20307	35.[E0GC	₹•	9.
313.20Jr0	60.1F900	C.	0.
31 3.2000	55.00000	0.	9.
713.23700	7C.6696º	C.	0.
313.20000	75.30002	ŗ.	9.
713.20000	90.0000	0.	0.
313.20300	85.00000	ů.	Ŏ.
31 7.27 3 20	90.00000	ë.	0.
370.60000	0.	Ğ.	Ď.
370.60000	5.66360	ç.	ů.
733.60900		٠ <u>.</u>	ũ.
370.60JJn	17.00000	č.	
	15.0000		7.
779.67J7C	20,0000	<u>0</u> .	G.
731.61330	25.00000	G.	c.
730.63700	30.00066	<b>3.</b>	0.
330.67300	35.06600	Ç.	0.
330.67000	40.00000	0.	Ū•
370.633°C	45.0 CQ G n	Ç.	3.
730.6000r	50.0000	n.	0.
330.60027	55.00000	0.	<b>0.</b>
370.60100	60.0000	9.	0.
330.6 JC	55 <b>.</b> 360 00	?•	0.
339.607JC	79.00000	C •	G.
773.60900	75.00000	0.	<b>9</b> •
374.69390	80.JC0CC	0.	0.
%30.60000	55.900CC	0.	0.
370.67300	<b>00.0</b> 0019	0.	9•
748.07000	0.	₽.	0.
348.03309	5.00000	' O.	C.
348.07955	10.0000	0.	0.
348.09000	15.10060	0.	C.
348.07300	20.0000	0.	0.
748.00000	25.00000	0.	7.
348.00300	30 60.0	Ö.	0.
748.00300	35.00000	0.	ŭ.
348.00300	40.00000	0.	0.
748.50700	45.00000	0.	0.
749.03208	50.00000	8.	0.
345.00030	55.000C	n.	•
			-
743.07307	60.300GC	0.	0.
749.07370	65.00000	0 •	0.
34 4 • 0 • 0 6 0	70.30000	n.	9.
748.07990	75.00360	9.	0.
348.00720	87.0000C	<b>0.</b>	0.
349. 20200	35.00000	0.	0.
349.07060	96.0060	9 •	0 •

755 40300	<b>A</b>	•	•
355.47303	r.	0 •	0.
355.41000	5.00740	0.	0.
335.40001	10.00000	••	g •
35 5. 43767	15.70000	C •	C •
365.41733	20.0000	C •	C.
355.42374	25.000.0	0.	Ċ.
755.40000	30.00000	9.	0 •
35 5 . 4 7 3 0 0	35.90000	r.	C •
355.40030	40.GC000	ç.	€.
765.43?37	45.30863	<b>3.</b>	C •
365.40000	50.20000	0.	C.
365.40000	55.00000	r.	0.
		•	
365.40000	50.00000		9•
<b>755.4</b> 7900	55.0CGir	0.	0.
75.5.43000	70.0000	0.	٠,
		2.	
355.40000	75.0C0CG	· •	Q •
365.4970c	93.00345	<b>C</b> •	C •
355.40003	95.50000	ů.	3•
365.41333	90.0000	0.	C.
	· · · · · · · · · · · · · · · · · · ·		
392.51000	<b>9</b> •	9•	0.
<b>737. 9300</b> 3	5.3000	0.	0•
382.80900	13.0050	Ç.	₹.
382.87100	15.0°066	^•	G •
732.80300	20.0000	<b>u</b> •	ŋ.
742,40010	25. 10000	G.	0.
		••	
382.83000	30.0000	•	C.
332.85300	35.3[201	0.	ŋ <b>.</b>
392,93000	40.00000	0.	0.
382.4308S	45.70000	r,	0.
332.87000	50.0000	٠.	0.
392.A0300	55. #(30r	•	C •
732.4000C	50.90000	n .	0.
342.80000	65.00000	0.	0.
387.83330	7v.J6966	C.	<b>0</b> •
385.41000	75.00300	?•	0.
797. # 100C	#9.00360	€.	G.
382. 41100	35.0000	Ĉ.	0.
392.8000C	90.0000	<u>"</u> •	<b>0</b> •
490.20306	n.	C •	<b>3.</b>
439.23900	5.0(0ag	G.	C.
			0.
430.20000	10.0000	<b>0</b> •	
400.20300	15.0000	C.	0•
409.23769	20.0000	0.	0.
433.23000	25.00500	<b>r</b> .	C.
4:3.23000	30.0000	g.	0.
400.27339	₹5.06000	0.	0 •
430.21000	40.00000	e.	0.
			_
430.23309	45.30000	₹.	2.
411.23113	53.GC3C^	<b>0</b> •	0.
403.20000	55.30000	r .	0.
430.27870	60.0000	0.	7.
410.23337	55.000EC	8.	0.
400.21100	70.0000	0.	ۥ
400.2000	75.00000	0.	0.
434.26360	30.6000	9.	0.
436.20090	45.GC360	0.	C.
420.20000	30.00000	r.	0.
	1 2 7 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	-637.15357	c.
417.43300	<b>C</b> •		
417.63333	5.0000	-1448.46717	-19.20930
417.63300	10.00000	-827.46865	-38.27240
417.57368	15.06660	-126,69356	-57.04422
417.57700	29.0000	205.43171	-75.38191

417.61773	25.0000	199.75761	-93.14539
	30.3000		
417.67220		190.57369	-110.20098
417.60702	35 <b>.</b> 5 ( 0 8 (	180.54271	-126.41737
417.57000	40.0000	168.43769	-141.57165
417.60000	45.00000	155.84772	-155.84772
417.60000	50.00000	141.67165	-168.83769
417.50000	55. C00C0	126.41737	-180.54271
417.61003	50.0000	110.20098	-190.87369
417.61000		93.14569	-199.75201
#I.*C.0.0	65.4(000	40.01.426.4	
417.67000	79.00000	75.38191	-207.11009
417.660un	75 <b>.</b> 0000	57.04422	-212.39194
	- · · · · · · · · · · · · · · · · ·		
417.53903	90,0000	38.27740	-217.05355
417.60000	95.0000	19.20930	-219.56326
	90.2000	0000	-110.2029A
417.63730	46.00000		
435.00000	ۥ	-1643.54798	0.
435.90939	<. CCOLC	-2887.77005	-40.81979
435.30307	1.7.00380	-17、1.63472	-79.73500
435.01770	15.000cm	-422.57358	-118.84336
435.07007	20.0000	437.31349	-157.04729
435.01007	25.80300	416.15438	-194,75597
435.00100	30.00000	397.65770	-229.58778
435.07300	35.9[nrr	376.13459	-263.37225
435.00000	40.2(008	351.74888	-295.15236
475.00000	45.0000	324.F5615	-324.6861"
435,03080	50.0000	295.15?36	-751.748E8
435.00000	55.00000	263.37228	-376.13450
435.C000C	60.00000	229.58778	- 397 <b>.</b> 6577 d
475,00000	65.0000	194.85597	-416.15438
	11711111		-
435.01001	70.0000	157.04729	-431.48388
435.00000	75.91019	118.64378	-447.52953
475.00778	80.00000	79.73500	-452.19965
435.07000	<b>45.</b> 00000	40.81979	-457.42825
435.0 20.7	90.0000	00000	-279.58778
	40.0 0 0001		
452.47000	<b>C</b> •	-1579.01666	0.
452.47933	5.00000	-2842.10396	- +2.957f1
: : : : : : : :			
45% 43000	10.0000	-1954.73590	-85.55828
452.47370	15.00000	-732.51919	-127,56758
452,40030			-168,57601
	50.0000	297.65050	
452.4^09J	25.0C00C	446.73796	-200.30148
452.43000	30.0000	426.84244	-246.44164
		· · · · · · · · · · · · · · · · · · ·	
452.40000	35.00000	403.74.35	-282.70624
455.43000	40.0000	377.57950	-716.819?7
452.40309	45.0000	348.52111	-348.52111
452.43070	≈0. ¬[00r	316.81927	-377.57956
452,40300	>5.0£0QC	282.79524	-403.74635
452.47970	60.0000	246.44164	-426.84944
452.43900	65.0000r	208.30148	-446.70396
マンショマリフェリ		168.57501	-463.15878
	70 01000	10042(944	
452.40001	79. CC CC	- · · · · · · · · · · · · · · · · · · ·	
452.40707	70.90000 75.00090	127.55758	-476.08859
452.40707	75.000.90	127.55758	
452.40001 452.40331 452.40370	75.000.90 80.0000	127.55758 85.58628	-485.39528
452.40001 452.40331 452.40378 452.40300	75.00090 80.0000 85.00000	127.55758	-485.39538 -491.90771
452.40001 452.40331 452.40370	75.000.90 80.0000	127.55758 85.58628	-485.39528
452.40707 452.40337 452.40370 452.40700 452.40707	75.000.90 80.00000 85.00000 90.00000	127.55758 85.58628 42.95761 03063	-485.395?8 -491.90771 -246.44164
452.40001 452.40335 452.40370 452.40301 452.40301	75.000.90 80.00000 85.00000 90.0000	127.56758 85.58628 42.95761 03063 -1511.97567	-485.39538 -491.00771 -246.44164 0.
452.40707 452.40337 452.40370 452.40700 452.40707	75.000.90 80.00000 85.00000 90.00000	127.55758 85.58628 42.95761 03063	-485.395?8 -491.90771 -246.44164
452.40001 452.40335 452.40370 452.40300 452.40301 459.80300	75.000.90 80.00000 85.00000 90.00000 0.	127.56758 85.58628 42.95761 03063 -1511.97567 -2769.32745	-485.39528 -491.00771 -246.44164 0. -45.51916
452.40001 452.40330 452.40370 452.40300 452.40301 459.80300 459.80300	75.000.90 80.00000 85.00000 90.00000 0. 5.00000	127.56758 85.58628 42.95761 03063 -1511.97567 -2769.32745 -2046.94309	-485.39518 -491.00771 -246.44164 0. -45.51916 -90.69189
452.40001 452.40330 452.40370 452.40300 452.40301 469.80300 469.80300 469.80300	75.000.90 80.000.00 85.000.00 97.300.00 0. 5.000.00 10.000.00	127.55758 85.58628 42.95761 03063 -1511.97567 -2769.32745 -2046.94309 -964.81499	-485.39528 -491.00771 -246.44164 0. -45.51916 -93.69189 -135.17441
452.40001 452.40330 452.40370 452.40300 452.40301 459.80300 459.80300	75.000.90 80.000.00 85.000.00 97.300.00 0. 5.000.00 10.000.00	127.56758 85.58628 42.95761 03063 -1511.97567 -2769.32745 -2046.94309	-485.39518 -491.00771 -246.44164 0. -45.51916 -90.69189
452.40001 452.40330 452.40370 452.40300 452.40301 469.80300 469.80300 469.80300	75.000.50 80.00000 85.00000 90.00000 0. 5.00000 10.00000 20.00000	127.56758 85.58628 42.95761 03063 -1511.97567 -2769.32745 -2046.94309 -964.81499 56.05567	-485.39518 -491.00771 -246.44164 0. -45.51916 -93.69189 -135.17441 -178.62816
452.40001 452.40330 452.40300 452.40300 452.40300 459.80300 459.80300 469.80300 469.80300	75.000.50 80.000.00 85.000.00 97.30000 10.00000 15.00000 20.00000	127.55758 85.58628 42.95761 03063 -1511.97567 -2769.32745 -2046.94309 -964.81499 56.05567 472.66007	-485.39528 -491.00771 -246.44164 0. -45.51916 -90.69189 -135.17441 -178.62816 -220.72245
452.40001 452.40330 452.40370 452.40300 452.40301 469.80300 469.80300 469.80300	75.000.50 80.00000 85.00000 90.00000 0. 5.00000 10.00000 20.00000	127.56758 85.58628 42.95761 03063 -1511.97567 -2769.32745 -2046.94309 -964.81499 56.05567	-485.39518 -491.00771 -246.44164 0. -45.51916 -93.69189 -135.17441 -178.62816
452.40001 452.40000 452.4000 452.4000 452.4000 459.8000 459.8000 469.8000 469.8000 469.8000	75.000.90 80.00000 85.00000 91.00000 0.5.00000 10.00000 25.000000 25.00000	127.55758 85.58628 42.95761 03003 -1511.97567 -2769.32745 -2046.94309 -964.81499 56.05567 472.66307 452.30238	-485.39528 -491.00771 -246.44164 0. -45.51916 -90.69189 -135.17441 -178.62816 -220.72245 -261.13690
452.40707 452.40770 452.40700 452.40707 452.40707 459.80707 459.80707 469.80707 469.80707 469.80707	75.000.00 85.0000 85.0000 91.0000 0. 5.0000 10.0000 25.0000 25.0000 35.0000	127.56758 85.58628 42.9576100003 -1511.97567 -2769.32745 -2046.94309 -964.81499 56.05567 472.66007 452.30238	-485.39528 -491.00771 -246.44164 045.51916 -90.69189 -135.17441 -178.62816 -220.72245 -261.13690 -299.56395
452.40707 452.40770 452.40700 452.40707 452.40707 459.80707 469.80707 469.80707 469.80707	75.000.50 85.000.00 85.000.00 97.000.0 10.0000.0000 25.0000.0000.0000.00000.00000.00000.00000.0000	127.56758 85.58628 42.9576100003 -1511.97567 -2769.32745 -2046.94309 -964.81499 56007 472.66007 452.30238 427.82185	-485.39518 -491.00771 -246.44164 0. -45.51916 -90.69189 -135.17441 -178.62816 -220.62816 -220.56395 -261.13690 -299.56395
452.40707 452.40770 452.40700 452.40707 452.40707 459.80707 459.80707 469.80707 469.80707 469.80707	75.000.00 85.0000 85.0000 91.0000 0. 5.0000 10.0000 25.0000 25.0000 35.0000	127.56758 85.58628 42.9576100003 -1511.97567 -2769.32745 -2046.94309 -964.81499 56.05567 472.66007 452.30238	-485.39528 -491.00771 -246.44164 045.51916 -90.69189 -135.17441 -178.62816 -220.72245 -261.13690 -299.56395

Pt 3. 8435C	50.01900	335.71113	-460.08494
469.47363	55.00000	299.55395	-427.92165
459.87700	63.173.00	261.13600	-452.30238
		220.72245	-473.34081
459.8C00C	55.0000	" <b>=</b> * ' . : " .	
469, 41231	79.30500	178.62816	-490.77684
659.87 <u>00</u> 0	75.0000	135.17441	-574.47775
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459. 80700	85.0000	45.51016	-521.28639
	73.0000		-261.13690
469.9090n		00200	- <u>-                                  </u>
497.20300	<b>u</b> •	-1442.66568	<b>C</b> •
497.21300	5.0.300	-2650.25659	-47.96502
447.20705	10.00303	-269^.17026	-95.36/75
497.23737	15.0070	-1136.75493	-142.14368
497.21931	20.0000	-195.57799	-157.53780
437.20000	36.0000	459.75669	-232.10237
		227 2 2 2 2	
487.27198	33.0000	475.62201	-274. 53050
487.23300	35.00360	449.67911	-315.JCA75
497.20703	4?.CC36?	420.71237	-353.01959
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504.60000	27.0000	-113.65718	-194.71357
544.6030"	25.30300	335.75350	-240.59473
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574.6030*	40.3000	98.75715	-560.64675
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534.60000	96.6000	03000	-284.54781
522.03330	G.	-1298.00965	<b>9.</b>
527.00330	5.0000c	-24513315	-51.14565
522. 0000	10.0000	-204, 77516	-131.90295
572.03300	15.70000	-1417.76763	-151.89293
572.030.0		-610.77406	-210.70787
	20.00303		****
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255.33396	70.0000	504.42272	-293.41528
522.01000	35,1000	460.70346	-376.59219
<b>*22.90</b> 000	<b>.0.</b> 0€00r	449.53829	-377.20742
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523.60000	45.00000	51.14565	-584.59750
522.00000	22.36060	[^^[]	-293.41529
		-1226.59182	r.
539.47070	^ ·		Ğ.
539.400.0	5.0(700	~2335.38848	-52.33397
539.40000	10.00040	-1995.74268	-194.96785
		T	~^
E30.47853	15.07636	-1461.52723	-155.40969
539.43900	20.00006	-777.01343	-205.36758
539.40966	25.40020	-48.19738	-253.76309
539.40JCC	39630.62	457.17906	-3:0.22731
530.40090	35.30000	491.20763	-344.43662
579.45-00	40.30006	459.07403	+785.9F479
540.49360	45. ^ (0 ( 6	424.55554	-424.58554
574,40310	50,0000	385 <b>.</b> 96479	-459. 37493
579.41007	55.0000	344.406F2	-491.36363
539.43770	67.1((()	370.72731	-526.38496
579,43336	65.00000	253.76309	-544.19670
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		336.62034	-305.20738
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556.8000n	40.Crûri	467.69483	-392.36714
		`	-431,62841
556. 40659	45.0[600	431.62441	" .
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556. * \$152	55.00060	350.11952	-530.92249
556.47000	50.0000	305.20738	-528.63468
556.P3398	65.GCQQC	257.97262	-55 3, 22364
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556.83700	89.57000	195.93741	-501.14118
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556.80101	30.0000	63630	-305.20738
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574.20000	85. BCGCC	57.68844	-613,66173
574.2000	90.00300	09009	-378.38291
591.60000	C.	-1019.41785	3.
>- T + OA (A.)	v •	**************************************	₩ ₩

591.60303	5.00300	-1967 <b>.</b> ▼9091	<b>+53.47</b> 8.92
571.60300	10,00000	-1763.22478	-107.34630
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F91.63180	20.30000	-1004.73125	
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525.47700	<b>₹</b> •	-858.19519	9.
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695.00000	57.00060	356.32778	-424.60
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696.30030	95. C1961	234.27743	-502.40956
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675.37300	90.0Lg3r	96.26 <b>145</b>	-545.92597
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		r)000	-277.17381
696.93330	90.0000		_
71.7.43737	7.	-585.47502	U .
713.40999	5• ∪ (1) C (1	-1148.67576	-46.21291
717.43700	10.30300	-1093.05947	-92.97411
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713.42300	?0.uC00C	20000	-265.11684
739.80300	Ŭ. 5. 0.000	-529.41571	0.
730.87309	5.00000	-1630.75763	-43.85943
733.90000	19.9000	-984.01889	-87.38506
730.80000	15.00330	-894.19189	-130.24564
733.80000	20.0000	-772.54073	-172.11498
730.89300	25.00000	-622.69364	-212.67441
			12.11.12
739.0000	37.00000	-448.67955	-251.61526
770.80300	35. CCQCQ	-255.27604	-288.54117
730.80000	40.5600	-47.89251	-323.47035
730.80080	45.00000	155.22818	-355.83772
730.80000	50.0000	296.91894	-385.49695
730.81300	55.CCQCC	289.64117	-412.27231
730.40000	69.91000	251.61526	-435.81042
739.89000	65.06000	217.67441	-456.08174
730.80950	70.0000	172.11498	-472.88201
730. 81000	75.30000	130.24564	-486,98336
770.23302	30.°C060	87.38506	-495.58532
730.85000	A5.GC0C0	43.85943	-501.31558
739.83069	90.0000	0000	-251.61526
748.21909	e.	-474.76911	٥.
744.29000	5.0000	-033.73116	-41,25023
748.23100		-685.36227	-82.18652
	10.00360		
748.29000	15.0COGC	-811.04343	-122.49733
744.21000	56.0000	-739.41214	-161.87585
745.27000	25.0000	-583.89167	-230.02240
748.20000	30.0000	-437.62289	-236. 84866
745.20000	75.00000	-274.20553	-271.46990
			<del>-</del>
748.2000r	40.0000	-97.65822	-304.22708
744.20000	42.0(090	47.61337	-334.66892
748.20000	50.uC0C0	233.51835	-362,56372
748.27000	55.00000	271.36208	-387.69919
748.20090	60.00000	236.64666	-409.88404
748.20000	65.0000		
		200.02240	-428,94942
749.21000	70.0000	161.87585	-444.75024
748.20000	75.60000	122.49733	-457.16624

74 9. 21000	90.0000	82.13652	-466.10293
744.20000	85.06300	41.25623	-471.49230
749.20039	90.7500	0000	-73£. F46FR
755.63°00	ე.	-421.62494	0.
765.67337	<b>☆.</b> 000 u^	-829.63071	-38.37169
755.60000	10.35050	-790.43843	-76.44936
765.60373		-724.09650	
	15.35000		-113.94620
755.61330	20	-643.07461	-150.57584
765.Kū10n	25.00000	-539.95611	-186.05951
765.66399	39.90960	-418,29627	-220.12715
765.60900	75.3(006	-281.19297	-252.51949
765.43633			I.I. I.
	48.00000	-131 - 7494 9	-282,90001
765.60101	45.00000	26.29775	-311.30650
765.60 <u>0</u> 00	50.JC3CC	169.52652	-377.25436
765.69330	55.66366	246.51468	-360.63521
765.69330	57.76300	220.12715	-351.27149
765.55000		186.[5951	
	65.5(10		-399.30590
765.50000	79.30300	\$50.57F64	-413.70371
765.60343	75.00000	117.94629	-425.25300
765.60300	97.0000	76.44036	-433.56584
765.69301	95.0000	38. 77369	-438,57900
		<del>-</del>	
765.60003	90,40000	77760	-220.12715
733.03100	٠.	-376.05430	₽•
783.01100	គ.ក023។	-728.76475	+35,70929
78 8. 0 3000	10.51840	-696.50769	-78.15361
7-3.0-076	15.00,00	-645.54575	-104.55875
			72311222
733.00010	50.0000	-576.83992	-138,16974
783.03030	25.0020	-491.63446	-179.72987
757.95939	30.00002	-39: 62766	-201.39764
783.70170	35.0000	-275.63566	-231.71415
783.20000	47.0066	-151.04124	-259.57417
743.90930	45.3000	-19.65178	-285.65791
757.35097	50.01360	111.15146	-309.45752
733.90538	55.00000	204.05379	-330.92210
743.73100	50.0000	201.99064	-349.35806
743.00000	65.00000	170.72987	-366.13139
733.03300	70.01300	138.16974	-379.61824
783.90000	75.9CGCG	194.55905	-390.21596
793.03:30	98.0F0Ci	76.15°61	-397.84398
793.39096	85.01360	3°.20929	-402.44472
783.00000	90.00060	09800	-201.99164
878.47337	7.	-319.94428	0.
#3G.4390°	5.0006	-630.59720	-31.78647
MO 0. 40770	13.00000	-634.45656	-63.33102
800.45000	15.0000	-563.90144	-94. 19758
809.43303	20.0000	-508.40724	-124. 3775
873.40966	25.0(0(0	-439.02016	-154、3259
000.41009	30.0000	-355.79041	-182, '5439
P30.47009	35.31000	-261.31429	-209.18837
Pag.41986	46.0000	-150.84306	-234.43029
89C.4300"	45.0000	-52.17946	-257.88806
#00.4000°		59.99632	-279.38714
	50.0000		
#37.49330	55.00000	152.70451	-298.75195
809.40900	50.01960	181.80665	-315.84708
800.40000	65.00000	154.13259	-330.53941
879.40009	70.00000	124.73775	-342.71416
#90.4333°	75.0000	94.79758	-352.28164
807.48007	#0.000C	63.33162	-359,16804
<b>e</b> 70.43000	45.00006	31.78547	-363,32096
P00.47003	97.0000	0000	-152.35439
P17. 900G0	0.	-271.31768	0.
817. R0007	5.00000	-535.16747	-28.09936
	5000,00	9 14211 41	( 5 5 5 7 5 6 1 )

817.80000	10.60046	-514.42075	-55.984.86
817. 90000	15.0000	-492.215FJ	-33.44428
417.49000	21.00001	-438.71988	-110.26865
P17. 97096	25.31000	-782.72914	-136.25380
817.8^700	30.0000n	-315.72673	-161,70195
817.80000	35.Cnocc	-246.96493	-184.92331
617.80930	4~. 20200	-150.F6379	-207.23727
817.m\C03	45.010CC	-72.38033	-227.97403
817. #6005	50.00000	19.00474	-246.97576
817. 27330	55.01310	103.72580	-264.09786
817.83309	F0.01676	154.07259	-279.21032
817.40000	55.0[0Cŭ	136.25380	-292.19722
817.80039	70.30000	110.25865	-302.96162
817.40900	75.9C0Qû	A3.44428	-311.41831
817.69020	90.0CJC^	55.98486	-317.50592
817.87767	A5.36036	28.03636	-321.17711
817.90900	90.0000	09768	-161.20198
M35.21798	r.	-123.76252	0.
835.2F00P	5.0000	-244.21438	-13.08091
P35.20013	10.06300	-275.06451	-26.96227
A35.29309	15.0000	-550.03219	-38.94527
<b>*35.20000</b>	20.00000	-201.52670	-51.33?64
835.23100	25.01000	-176.62077	-63.42934
P35.20300	30.00000	-147.11755	-75.94330
#35.20000	35.0000	-114.10422	-86.00614
435.20110	40.0000	-77.95615	-96.47351
#35.2113	45.00000 .	-39.03324	-106.127?6
635.21900	50.00300	1.72957	-114.97301
835.21331	55.0(0ùr	41.23055	-172.94375
#35.2;B11	63. 00000	67.96017	-129.97881
837.20900	65.0000	63.42934	-136.92466
AT5.23098	70.40666	51.33264	-141.03527
P35.20039	75 0000	<b>35.84527</b>	-144.97253
A35.20300	48.61165	26.95227	-147.80645
e75.20399	45.0003.	13.05091	-149,51548
835.20000	90.0000	78000	-75,34330

## LISTING OF WATER IMPACT LOADS PRUGRAM

```
PROGRAM DD(INPUT.OUTPUT.FAPEZ=INPUT.TAPEJ=OUTPUT.PUNCH)
C
    MOD TO OBTAIN PUNCHED CARDS ONLY.
      DIMENSION VSD(20), WA(20), PN(20), WSR(20), HPR(20), CPR(20), XCORD(100)
      DIMENSION YCORD (37) + SEGLX (37) + NSEGX (37) + DL (37) + SEGLY (20) + NSEGY (20)
      DIMENSION DC(20).DVSD(20).UWA(20).DPN(20).XPN(100).XWA(100)
      DIMENSION CWSR(100+37)+PCK(100+37)+PL(100+37)+DWSK(20)+DHPK(20)
      DIMENSION DCPR(20) +ANL(100+37) +AVL(100+37) +TVL(100) +TVLXC(100)
      DIMENSION RL(100)+AWA(100)+VIL(100+37)+ANIL(100+37)+ATIL(100+37)
      DIMENSION TVIL(100) + REACT(100) + STRAP(100)
    1 FORMAT(1615)
    2 FURMAT (6F10.5)
    3 FORMAT (8F10.5)
    4 FORMAT (8E10.6)
    5 FORMAT (3F20.5)
    6 FORMAT(SF20.5)
    7 FURMAT(10X,4HTNT=,F10.5)
    8 FORMAT (10x,3HVSD,10X,2HWA,10x,2HPN,//)
    9 FORMAT(9X+F10.5+8X+F10.5+8X+F10.5)
   10 FORMAT (1H1)
   11 FORMAT(10x+3HwSR+10x+3HhPR+10x+3HCPR+//)
   12 FORMAT(9x.F10.5,8x.F10.5,8x,F10.5)
   13 FORMAT(2X.5HPMAX=.F10.5.2X.2HT=.F10.5.2X.3HVV=.F10.5.2X.3HVV=.F10.
     15,2X,2HR=,F10.5,2X,3HVL=,F10.5)
   14 FORMAT (1UX+4HDVSD+20X+3HDWA+2UX+3HDPN+//)
   15 FORMAT (2x,F20.5,5x,F20.5,3,,F20.5)
   16 FORMAT(10X+5HXCURD+20X+3HXPN+20X+3HAWA+//)
   17 FORMAT (10X,4HDWSR,20X,4HUHPR,20X,4HUCPR,//)
   18 FORMAT(8X.SHXCORD.15X.SHYCURU.15X.4HCWSR.17X.3HPCR.17X.2HPL.//)
   19 FORMAT(8X,5HXCORD,15X,5HYCORD,16X,3HANL,17X,3HAVL,17X,3HTVL,//)
   20 FORMAT(8x+5HXCORD+16x+3HTVL+16X+5HTVLXC+//)
   21 FORMAT (5x,5HSTVL=,F10,2,5x,7HSTVLXC=,F15,2,5X,6HS2TVL=,F10,2,5X,3H
     1CP=+F10.2)
   22 FORMAT(10x,5HXCORD,2Ux,3HXWA,2UX,2HRL,//)
   23 FORMAT(8x,5HxCORD+15x,5HYCORD+16x,3HVIL+16x,4HANIL+16x,4HATIL+//)
   24 FORMAT(10X,3HUB=,F20.10)
   25 FORMAT (E10.3.315)
   26 FORMAT (8x.5HXCORD.15x.5HYCORD.16X.3HANL.16X.4HAT1L.//)
C
  27 FORMAT (4F20.5)
   28 FORMAT(F10.2,10X,F10.2)
C
                     LIST OF PROGRAM NUMENCLATURE
CA
           DEGREE TO RADIAN CUNVERSION
C ANGLE
           180 LESS INCLUSIVE ANGLE/2 OVER WHICH REACTING STRAP BEARS
C ANIL
           NORMAL INERTIA LOAD COMPUNENT AT A NODE
C ANL
           NORMAL LOAD AT MESH POINT
           TANGENTIAL INERTIA LOAD COMPUNENT AT A NODE
C ATIL
C AVL
           VERTICAL COMPUNENT OF NORMAL LOAD
C AWA
           WETTED ANGLE AT MESH POINT
C CP
           CENTER OF PRESSURE
C CPR
           RADIAL PRESSURE DISTRIBUTION CURVE 2 (WETTED ANGLE EQUAL 90)
C CWSR
           WETTED SURFACE RATIO OF YCORD IN MESH
CD
           VEHICLE DIAMETER
C DC
           INCREMENTAL LENGTH IN SEGMENT Y
C DCPR
           INCHEMENTAL PRESSURE HATTO FOR CURVE 2
           INCREMENTAL F. ESSURE RATIO FOR CURVE 1
C DHPR
           INCREMENTAL LENGTH IN SEGMENT X
C DL
C UPN
           INCHEMENTAL PRESSURE
C DVSD
           INCHEMENTAL VEHICLE STATION
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C DWA
           INCREMENTAL WETTED ANGLE
           INCHEMENTAL WETTED SURFACE HATTO
C DWSR
C DX
           INCREMENTAL DISTANCE ALUNG & COORDINATE
C DY
           INCREMENTAL DISTANCE ALONG Y COORDINATE
C HC
           PORTION OF VEHICLE CIRCUMFERENCE
C HPR
           HADIAL PRESSURE DISTRIBUTION CURVE 1 (WETTED ANGLE LESS 90)
C HV
           HORIZONTAL VELOCITY
C KO
           CODE FOR DESIRED OUTPUT (0.1. OR 2)
C LA
           CODE FOR SHAPE OF PRESSURE CURVE (0 OR 1)
           CODE FOR SHAPE OF WETTED ANGLE CURVE (0 OR 1)
C LP
C
           NUMBER OF COLUMNS ALONG Y COORDINATE DIRECTION
 NC
           NUMBER OF CIRCUMFERENTIAL DATA POINTS FOR PRESSURE
C NCDP
C NLDP
           NUMBER OF LONGITUDINAL DATA POINTS FOR KEEL PRESSURE
C NNX
           NUMBER OF SEGMENTS IN X DIRECTION WITH CONSTANT SPACING
           NUMBER OF SEGMENTS IN Y DIRECTION WITH CONSTANT SPACING
C NNY
C NR
           NUMBER OF ROWS ALONG X COURDINATE DIRECTION
C NSEGX
           NUMBER OF MESH SPACES WITHIN SEGMENT X
C NSEGY
           NUMBER OF MESH SPACES WITHIN SEGMENT Y
C PCR
           PRESSURE RATIO OF YCORD IN MESH AT A LONGITUDINAL STATION
C PI
C PL
           PRESSURE AT YCORD IN MESH
C PMAX
           MAXIMUM PRESSURE
C PN
           NORMALIZED PRESSURE AT A VEHICLE STATION
CR
           VEHICLE RADIUS
C REACT
           UNIFORM STRAP BEARING LOAD AT A LUNGITUDINAL STATION
C RL
           AVERAGE PEAK RUNNING LOAD AT A LONGITUDINAL STATION
C SEGLX
           LENGTH OF SEGMENT IN X DIRECTION
C SEGLY
           ANGLE OF SEGMENT IN Y DIRECTION
C STRAP
           STRAP TENSION LOAD AT A LONGITUDINAL STATION
           TOTAL VERTICAL INERTIA LOAD ON VEHICLE
C STVIL
           HALF OF TOTAL VERTICAL PRESSURE LOAD ON VEHICLE
C STVL
C STVLXC
           TOTAL FIRST MOMENT OF VERTICAL PRESSURE LOAD ON VEHICLE
C SETVL
           TOTAL VERTICAL LUAD ON VEHICLE DUE TO PRESSURE
           TIME POINT NUMBER
CT
C THETA
           INCLUSIVE ANGLE USED IN VEHICLE MODEL (90 OR 180)
C TL
C TNT
           TOTAL X LENGTH
           TOTAL NUMBER OF TIME POINTS
C TVIL
           TOTAL VERTICAL INERTIA LOAD AT A VEHICLE STATION
           TOTAL VERTICAL PRESSURE LOAD AT A VEHICLE STATION FIRST MOMENT OF TOTAL VERTICAL PRESSURE LOAD AT A STATION
C TVL
C TVLXC
           UNBALANCE BETWEEN PRESSURE AND INERTIA LOADING
C UB
C VIL
           VERTICAL INERTIA LOAD AT A MESH POINT
C VL
           VEHICLE LENGTH
C VSD
           NON*DIMENSIONAL VEHICLE STATION IN DIAMETERS
C AA
           VERTICAL VELOCITY
C WA
           WETTED ANGLE AT A VEHICLE STATION
           WETTED SURFACE HATIO
X-COORDINATE UF MESH POINT
C WSR
C XCORD
           MAX PRESSURE AT A ROW IN MESH
C XFN
C XWA
           AVERAGE WETTED ANGLE AT A HOW IN MESH
           Y-COORDINATE OF MESH POINT
C YCORD
      INTEGER Z.Y.X
      Z=1
      Y=2
      X=3
      READ (2.2) THT
      WRITE (3.7) THT
   29 READ(2+1)NLDP+NCDP+LA+LP+KO
    READING OF DATA POINTS WHICH REPRESENT WETTED ANGLE AND NORMALIZED
    PRESSURE CURVES
      READ(2.2)(VSD(1).WA(1).PN(1).I=1.NLDP)
```

```
C
      WRITE (3.8)
      MRITE(3.9)(VSD(I).WA(I).PN(I).I=1.NLUP)
C
    READING OF DATA POINTS WHICH REPRESENT PRESSURE RATIO CURVES
      REAU(2.2) (WSR(I).HPR(I).CPR(I).I=1.NCUP)
C
      WHITE (3.11)
C
      WRITE (3.12) (WSR(1), HPR(1), CPR(1), 1=1, NCDP)
      REAU(2+3) PMAX+T+VV+HV+R+VL+THETA+ANGLE
C
      WRITE (3-13) PMAX, T, VV, HV, R, VL
      U=2.*R
      A=0.01745329252
    DIMENSIONALIZING OF LONGITUDINAL AND PRESSURE RATIO CURVES
C
      DO 30 I=1+NLOP
      VSD(I)=VSU(I)+D
   30 PN(1)=PN(1) *PMAX
C
      WRITE (3.8)
      WRITE (3,5) (VSD(I), WA(1), PN(I), I=1, NLDP)
      HEAD (2.1) NP.NC
      IF (NR) 40,50,50
C
    CALCULATION OF X COORDINATES IF MESH SPACING IS CONSTANT
   60 DX=VL/(NR-1)
      DO 70 I=1.NR
      1F(1.E4.1) GO TO 65
      XCORD(1)=XCORU(1-1)+DX
      60 TO 70
   65 XCORD(1)=0.
   70 CONTINUE
      GO TO 61
   READING OF X COORDINATES IF SPACING IS VARIABLE
   40 NH=-NR
      READ(2,4) (XCURD(1),1=1,NK)
      GO TO 61
    CALCULATION OF X COORDINATES IF SPACING IS CONSTANT WITHIN EACH
    SEGMENT BUT VARIES FROM SEGMENT TO SEGMENT
   50 READ(2,1)NNX
      READ(2,4) (SEGLX(I)+1=1+NNX)
      READ(2+1) (NSEGX(I)+I=1+NNX)
      NR=1
      DO 90 1=1.NNX
      DL(I)=SEGLX(I)/NSEGX(I)
   90 NR=NR+NSEGX(I)
      .j= }
      TL=SEGLX(J)
      DO 100 I=1.NR
      IF(1.EQ.1) GO TO 85
   95 IF (XCORD(I-1).LT.TL) GO TO 105
      J=J+1
      TL=TL+SEGLX(J)
      GO TO 95
  105 XCORD(I)=XCORD(I-1)+DL(J)
      GO TO 100
   85 XCORU(1)=0.
  100 CONTINUE
   61 IF (NC) 63,64,62
    CALCULATION OF Y COORDINATES IF MESH SPACING IS CUNSTANT
   62 DY=THETA/(NC-1)
      DO 80 I=1.NC
      IF(I.E4.1) GO TO 75
      YCORD(1)=YCORD(1-1)+DY
      60 TO 80
   75 YCORD(1)=0.
   80 CONTINUE
```

```
GO TO 120
READING OF Y COORDINATES IF SPACING IS VARIABLE
C
   63 NC=-NC
      READ(2,4) (YCORU(1),1=1,NC)
      60 TO 120
    CALCULATION OF Y COORDINATES IF SPACING IS CONSTANT WITHIN EACH
    SEGMENT BUT VARIES FROM SEGMENT TO SEGMENT
   64 READ(2.1) NNY
      READ(2.4) (SEGLY(I).I=1.NNY)
      READ(2,1) (NSEGY(1), I=1, NNY)
      NC=1
      DO 110 I=1.NNY
      DC(I) = SEGLY(I) / NSEGY(I)
  110 NC=NC+NSEGY(I)
      J=1
      TC=SEGLY(J)
      DO 120 I=1.NC
  IF(I.EQ.1) GO TO 115
125 IF(YCORD(I-1).LT.TC) GO TO 130
      J=J+1
      TC=TC+SEGLY(J)
      GO TO 125
  130 YCORD(I)=YCORU(I-1)+UC(J)
      GO TO 120
  115 YCORD(I)=0.
  120 CONTINUE
      WRITE (3.1) NR.NC
      N=NLOP-1
    CALCULATION OF INCREMENTAL VSD , PN , WA
      DO 140 I=1+N
      DVSD(I)=VSD(I+1)-VSD(I)
      IF(LP-1)141,142,142
  141 DPN(I)=PN(I+1)-PN(I)
      GO TO 147
  142 IF(PN(1).EQ.0.0.OR.PN(1+1).EQ.0.0) GO TO 143
      GO TO 141
  143 UPN(I)=0.0
  147 IF(LA-1)144,146,146
  144 DWA(I)=WA(I+1)-WA(I)
      GO TO 140
  146 IF (WA(1).EQ.0.0.OR.WA(I+1).EQ.0.U) GO TO 148
      GO TO 144
  148 DWA(1)=0.0
  140 CONTINUE
      WRITE (3.14)
      write(3.15)(DVSD(I).DWA(I).DPN(I).I=1.N)
    CALCULATION OF MAX PRESSURE AND WETTED ANGLE AT X STATION IN MESH
      J=1
      L=1
      DO 150 I=1+NR
      IF(1.EQ.1) GO TO 135
      IF (LP-1)145+186+186
  145 IF(XCORD(I).LE.VSD(J+1)) GO TO 155
      J=J+1
      Gn TO 145
  155 XPN(I)=PN(J)+(XCORU(I)-V5D(J))+DPN(J)/DV5D(J)
      GO TO 187
  186 IF(1.LT.NR.AND.PN(J+1).GT.0.0) GO TO 305
      XPN(I)=PN(J+1)
      GU TO 187
  305 IF (VSD(J+1)-XCORD(I))196+196+184
```

```
196 J=J+1
      GO TO 305
  184 IF (PN(J)) 155+181+155
  181 XPN(I)=0.0
      GO TO 187
  135 XPN(I)=PN(I)
      AWA(1)=WA(1)
      GO TO 150
  187 IF (LA-1) 188,189,189
  188 IF (XCORD(I).LE.VSD(L+1)) GO TO 193
      L=L+1
      GO TO 188
  193 AWA(I) = WA(L) + (XCORU(1) - VSU(L)) + DWA(L) / DVSD(L)
      GO TO 150
  189 IF (1.LT.NR.AND.WA(L+1).GT.0.0) GU TO 310
      AWA(I)=WA(L+1)
      GJ TO 150
  310 IF (VSD(L+1)-XCORD(I))197+197+191
  197 L=L+1
      GO TO 310
  191 IF (WA(L))193+192+193
  192 AWA(I)=0.0
  150 CONTINUE
C
      WRITE (3,16)
      WHITE (3+15) (XCORD(I)+APN(I)+AWA(I)+I=1+NR)
C
    CALCULATION OF RL AT EACH X STATION
      L=1
      00 151 I=1.NR
      IF(LP-1)162,163,163
  162 IF(I.EQ.1) GO TO 152
      IF(1.E4.NR) GO TO 153
  164 RL(I) = (XPN(I+1) + XPN(I)) + (XCORD(I+1) - XCORD(I)) / 4. + (XPN(I) + XPN(I-1))
     1 * (XCORD(I) - XCORD(I-1))/4.
      GO TO 151
  152 RL(I)=(XPN(I+1)+XPN(I))+(XCORU(I+1)-XCORD(I))/4.
      L=L+1
      GO TO 151
  153 RL(I)=(XPN(I)+XPN(I-1))*(XCORD(I)-XCORD(I-1))/4.
      GO TO 151
  163 [F(XPN(I))154,154,156
  156 IF(L.EQ.1) GO TO 152
      IF(I.EQ.NR.OR.XPN(I+1).EQ.0.0) GO TO 153
      GO TO 164
  154 RL(I)=0.0
  151 CONTINUE
    CALCULATION OF XWA AT EACH X STATION
      L=1
      DO 159 I=1+NR
      IF(LA-1)171,172,172
  171 IF(I.EU.NR) 60 TO 157
      IF (AWA(I).EQ.0.0) GO TO 177
  176 XWA(I)=(AWA(I+1)+AWA(I)+AWA(I-1)+AWA(I))/4.
      GO TO 159
  177 IF (AWA(1+1)-AWA(1))157+157+158
  157 XWA(I)=(AWA(I-1)+AWA(I))/2.
      GO TO 159
  158 XWA(I)=AWA(I+1)/2.+AWA(1)/2.
      L=L+1
      GO TO 159
  172 IF (AWA(I))174,174,173
  173 IF(L.EQ.1) GO TO 158
```

```
IF(I.EQ.NR.OR.AWA(I+1).EQ.0.0) GU TO 157
      GO TO 176
  174 XWA(I)=0.0
  159 CONTINUE
C
      WRITE (3,22)
      write(3,15)(xcord(1),xwa(1),rL(1),I=1,NK)
    CALCULATION OF INCREMENTAL WSR . HPR . CPR
      M=NCDP=1
      DO 180 I=1.M
      DWSR(I)=WSR(I+1)-WSR(I)
      OHPR(I)=HPR([+1)-HPR(])
      DCPR(I)=CPR(I+1)-CPR(I)
  180 CONTINUE
      #RITE (3.17)
C
      WRITE (3,15) (DWSR(I) + DHPR(I) + DCPR(I) + I=1, M)
C
    CALCULATION OF CWSR . PCR . PL FOR EACH NODE POINT IN MESH
      DO 160 I=1.NR
      K=1
      DU 160 J=1+NC
      IF(YCORD(J).GT.XWA(I).OR.XWA(I).EQ.O.) GO TO 165
      CWSH(I+J)=YCORD(J)/XWA(I)
  170 IF(CWSR(I+J).LE.WSR(K+1)) GO TO 175
      K=K+1
      GO TO 170
  175 IF (XWA(I).LT.90.0) GO TO 185
      PCR(I+J)=CPR(K)+(CWSR(I+J)-WSR(K))+DCPR(")/DWSR(K)
      GO TO 190
  185 PCR(I+J)=HPR(K)+(CWSR(I+J)-WSR(K))*DHPR(K)/DWSR(K)
  190 PL(I,J)=PCR(I,J)*RL(I)
      GO TO 160
  165 PCR(I.J)=0.
      PL(I.J)=0.
  160 CONTINUE
C
      WRITE (3.18)
      WRITE(3.6)((XCORD(I),YCORD(J),CWSR(I.J),PCR(I.J),PL(I.J),J=1.NC),I
C
     1=1.NR)
C
    CALCULATION OF ANL , AVL , TVL FOR EACH Y STATION ALONG X COORDINATE
      S=A+R
      00 200 I=1.NR
      TVL(1)=0.
      DO 200 J=1.NC
      IF (J.EQ.NC) GO TO 230
      IF (J.EQ.1.AND.XWA(1).GE.YCORD(J+1)) GO TO 205
      IF(XWA(I).LT.YCORD(J+1).AND.J.EQ.1) GO TO 225
      IF(XWA(I).LE.YCORD(J).AND.PL(I.J+1).EQ.0.0) GO TO 230
      IF(PL(I+J+1).EQ.0.0.AND.XWA(I).GT.YCORD(J)) GO TO 235
      ANL(I,J)=S+((YCORD(J+1)-YCORD(J))+(PL(I,J+1)+PL(I,J))/(4.+COS(A+((
     1YCORD(J+1)+YCORD(J)}/2.-YCORD(J))))+(YCORD(J)-YCORD(J-1))*(PL(I+J)
     2+PL(1+J-1))/(4.+COS(A+(YCORD(J)-(YCORD(J)+YCORD(J-1))/2.))))
      60 TO 215
  205 ANL(I+J) =S*((YCORD(J+j)-YCORD(J))*(PL(I+J+1)+PL(I+J))/4.1/COS(A*(Y
     1CORD(J+1)-YCORC(J))/2.)
      60 TO 215
  225 ANL(1.J)=S+(XWA(1)-YCOHD(J))+(PL(I,J)/2.)+(1.-(XWA(I)-YCOHD(J))/(2
     1.*(YCORD(J+1)-YCORD(J))))/COS(A*(XWA(I)-YCORD(J))/2.)
      60 TO 215
  230 ANL([+J)=S*(XWA(I)-YCORD(J-1))*(PL(I+J-1)/2.)*(XWA(I)-YCORD(J-1))/
     1(2.*(YCOND(J)-YCORD(J-1)))*COS(A*(YCORD(J)-(XWA(I)+YCORD(J+1))/2.)
     2)
      GO TO 215
  235 ANL(I+J)=$*(YCORD(J)-YCORD(J-1))*(PL(I+J)+PL(I+J-1))/(4+COS(A*(YC
```

```
10RD(J) = (YCORD(J) + YCORD(J-1))/2.))) + ($\(\max_{4}\) = YCORD(J) ) + ($\(\max_{4}\) | \(\max_{4}\) | \(\max_
           2.) + (1.-(XwA(1)-YCOk)(J))/(2.+(YCORD(J+1)-YCORD(J)))))/CO5(A+((XwA(
           31) +YCORU(J))/2.-YCORU(J)))
    215 AVL(I+J)=ANL(I+J)+COS(A+YCORU(J))
              TVL(I)=TVL(I)+AVL(IsJ)
    200 CONTINUE
C
              WRITE (3+19)
C
              \mathsf{WRITE}(3+6)((\mathsf{XCORD}(1),\mathsf{YCOHD}(J),\mathsf{ANL}(1+J),\mathsf{AVL}(1+J),\mathsf{TVL}(1),\mathsf{J=1},\mathsf{NC})\cdot 1=1
¢
           1 . NR)
         PUNCHED OUTPUT OF PRESSURE LOADS AT NODE POINTS
              IF (KO-1)405,425,960
    405 DO 400 I=1+NR
             DO 400 J=1.NC
              IF (ANL (I.J) . EQ. U. 0) GO TU 400
              IF (J.EQ.NC) GO TO 435
              ANL(I+J) =-ANL(I+J)
              GO TO 425
    435 ANL(I+J)=-ANL(I+J)/2.
              GU TO 420
    420 PUNCH 25,ANL (1, ., , 1, J, Z
    400 CONTINUE
             GO TO 650
        CALCULATION OF NORMAL STRAP REACTION LOADS
    960 DU 900 I=1.NR
              IF(TVL(1).EQ.0.0) GO TO 905
              STRAP(1)=TVL(1)/SIN(A+(160.-ANGLE))
             REACT(I)=-STRAP(1)/R
              GO TO 900
    905 REACT(1)=0.0
              STHAP(1)=0.0
    900 CONTINUE
             DO 950 I=1.NR
             DO 950 J=1.NC
              IF (REACT(I).EQ.C.O) GO 10 950
              IF(J.EQ.NC) GO TO 945
              IF (YCORD (J) .GE.ANGLE) GO TO 935
              ANIL (I.J) =P.O
              GO TO 950
    935 IF (YCORD(J). EQ. ANGLE) 60 TO 930
             ANIL(I*J)=S*REACT(I)*(YCORD(J+1)-YCORD(J))/(2*CUS(A*(YCORD(J+1)
           1+YCORD(J))/2.-YCORD(J))))+(YCORD(J)-YCORD(J-1))/(2.#CO5(A#(YCORD(J
           ?) - (YCOHD(J) + YCORD(J~1))/2.))))
             GO TO 540
    930 ANIL(I+J)=S*REACT(I)*(YCORD(J+1)=YCORD(J))/(2**CO5(A*(YCORD(J+1)=Y
           1CORD(J))/2.))
             GC TO SAD
    945 ANIL(I,J)=S*REACT(I)*(YCORD(J)-YCORD(J-1))/(2.*CUS(A*(YCORD(J)-YCO
          1RD(J-?))/2.))
    940 PUNCH 25.ANIL(I.J).I.J.Z
    950 CONTINUE
             GO TO 405
        CALCULATION OF VIL , ANIL , ATIL FOR EACH Y STATION
    425 P1=3.14159265359
             HC=THETA+PI+R/180.
             DO 600 I=1.NR
             TYIL(I)=0.
             DO 600 J=1.NC
             IF(TVL(1).EQ.0.0) GO TO 620
             IF (J.EW.1) GO TO 605
             IF (J.EQ.NC) 60 TO 610
```

```
VIL([,J)=S*(YCORD(J+1)-YCORD(J-1))*TVL(I)/(2.*HC)
      60 TO 615
  685 VIL(I+J)=S*(YCORD(J+1)-YCORD(J))*TVL(I)/(2.*HC)
      GO TO 615
  610 VIL([+J)=5*(YCORD(J)-YCORD(J-1))*TVL([)/(2.*HC)
  615 ANIL(1.J)=VIL(1.J)*COS(A*YCOKU(J))
      ATIL(I.J) =-VIL(I.J) +SIN(A+YCORD(J))
      GO TO 625
  0.0=(L.1) JIMA 050
      0.0=(L.I) ITA
  625 TVIL(1)=TVIL(1)+VIL(1.J)
  600 CONTINUE
C
      IF (KO)650,650,640
C 640 WRITE (3,23)
      UNACE (L.) ATTA; (L.) ANIE (1.) ANIE (1.) ANIE (1.) ATTE (1.) SANIE (1.)
     1.1=1.NK)
  650 STVL=0.
      STVLXC=0.
      STVIL=U.
    CALCULATION OF HALF STVL . STVLAC . TYLXC . STVIL
      DO 250 1=1.NR
      TVLXC([)=TVL([)=XCORD([)
      STVL=STVL+TVL(1)
      STVIL=STVIL+TVIL(I)
      STYLXC=STYLXC+TYLXC(1)
  250 CONTINUE
      WHITE (3.20)
      WRITE(3.5)(XCORD(I).TVL(I).TVLXC(I).I=1.NR)
C
    CALCULATION OF TOTAL PRESSURE LUAD ON VEHICLE AND CENTER OF PRESSURE
      CP=STVLXC/STVL
      S2TVL=2.*STVL
      WRITE(3,21)STVL,STVLXC,S2TVL,CP
      PUNCH &B.SZTVL.CP
C
    INERTIA LOADING BALANCES TOTAL VERTICAL PRESSURE LOAD CHECK
      UH=STVL-STVIL
      WRITE (3,24)Ub
      1F(KO-1)670,660,670
    CALCULATION OF NET NORMAL AND TANGENTIAL LOADS AT A MESH POINT
 660 DO 700 I=1.NR
DO 700 J=1.NC
      IF(TVL(1).EQ.0.0) 60 TO 700
      IF (J.EU.NC) 60 TO 710
      ANL(I,J) = -ANL(I,J) + ANIL(I,J)
      ATIL(I,J)=ATIL(I,J)
      GO TO 700
  710 ANL(I.J)=1.*ANIL(I.J)-ANL(I.J)/2.
      ATIL(I+J)=1.*ATIL(I+J)
  700 CONTINUE
      #RITE (3,26)
      WRITE(3,27)((XCORD(1),YCORD(J),ANL(I,J),ATIL(I,J),J=1,NC),I=1,NH)
    PUNCHED OUTPUT OF NET PRESSURE AND INERTIA LOADS.
      DO 800 I=1.NR
      DO 800 J=1.NC
      PUNCH 25.ANL J).I.J.Z
      PUNCH 25.AT.
                     ,J).I.J.Y
  800 CONTINUE
  670 IF (T.EQ. THT) GO TO 500
      60 TO 29
  500 CALL EXIT
      END
```

## LISTING OF INPUT DATA CARDS FOR THE 3 SUPPLEMENTAL PROBLEMS

3.0								
3	10	1	l	0				
0.0		0.0		0.0	3.47915	15.0	1.0	
6.958	34	60.0		0.17778				
0.0		1.0		0.0	0.11111	0.98481	0.0	
0.222	22	0.93	969	0.0	0.33333	0.86603	0.0	
0.444	44	0.76	604	0.0	0.55555	0.64279	0.0	
0.666	66	0.5		0.0	0.77777	0.34202	0.0	
0.488	88	0.17	365	0.0	1.6	0.0	0.0	
25.0		1.0		60.0	60.0	60.0	<b>835.0</b>	90.0
21	19							
3	10	1	1	0				
0.0		15.0		1.0	3.47916	60.0	0.17778	
6.958	34	0.0		0.0				
0.0		1.0		0.0	0.11111	0.98481	0.0	
0.222	22	0.93	969	0.0	0.33333	9.86603	0.0	
0.444	44	0.76	604	0.0	0.55555	0.64279	0.0	
0.666	66	0.5		0.0	0.77777	D.34202	0.0	
0.888	88	0.17	365	0.0	1.0	0.0	0.0	
25.0		2.0		60.0	60.0	60.0	835.0	90.0
21	19							
4	10	1	1	0				
0.0		0.0		0.0	1.73958	15.0	1.0	
5.218	75	60.0		0.17778	6.95834	0.0	0.0	
0.0		1.0		0.0	0.11111	0.98481	0.0	
0.222	55	0.93	969	0.0	0.33333	0.86603	0.0	
0.444	44	0.76	604	0.0	0.55553	0.64279	0.0	
0.666	66	0.5		0.0	0.77777	0.34202	0.0	
0.888	88	0.17	365	0.0	1.0	0.0	0.0	
25.0		3.0		60.0	60.0	60.0	635.0	90.0
51	19							

## LISTING OF PUNCHED LUAD CARDS FOR THE 3 SUPPLEMENTAL PROBLEMS

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-1.522E+03	11	3	1
-6.269E+02	11	4	1
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-2.406E+03	15	ĭ	ī
-4.423E+03	iż	è	i
-3.328E+03			i
	12	3	i
-1.751E+03	1.	4	
-3.595E+02	12	5	1
-2.223E+03	13	1	1
-4.207E+03	13	5	1
-3.521E+03	13	3	1
-2.464E+U3	13	4	1
-1.210E+03	13	5	1
-1.883E+02	13	6.	1
-2.018E+03	14	1	1
-3.882E+03	14	2	1
-3.435E+03	14	3	ĩ
-2.731E+03	14	4	ĩ
-1.820E+03	14	Š	ī
-8.402E+02	14	6	ī
-9.647E+01	14	7	i
-1.807E+03	15	í	i
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-3.509E+03	15	2	j
-3.208E+03	15	3	j
-2.729E+03	15	•	j
-2.094E+03	15	5	1
-1.341E+03	15	6	1
-5.801E+0Z	15	7	ı
-4.688E+01	15	8	1
-1.591E+03	16	1	1
-3.110E+03	10	2	1
-2.991E+03	16	3	1
-2.569E+03	16	4	1
-2.127E+03	16	5	1
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-2.095E+01	16	9	ī
-1.373E+03	17	í	i
-2.697E+03	17	į	i
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-2.321E+03	17	4	1
-2.008E+03	17	5	1
-1.626E+03	17	6	1
-1.188E+03	17	7	j
-7.084E+02	17	8	1
-2.632E+02	17	9	1
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252741.83 +07.19
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